Amphibian and Reptile Inventory on the

Headwaters and Dillon Resource Areas

in conjunction with

Red Rock Lakes National Wildlife Refuge

Final Report to:

Bureau of Land Management
and
US Fish and Wildlife Service

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ABSTRACT

A total of 81 site surveys were made from 1996 through 1998 on lands administered by the Bureau of Land Management and by the U.S. Fish and Wildlife Service in south-western Montana. Localized areas across the entire region were covered in the surveys. Included during the inventories were the BLM Headwaters and Dillon Resource Areas and the Red Rocks National Wildlife Refuge. The majority of the surveys of ponds, lakes, seeps, streams or other wetlands were conducted by one individual. Each survey took from 20 to 120 person-minutes and consisted of a thorough search of the wetland perimeter and netting of near shore aquatic habitats for adults, eggs, larvae, and tadpoles. Stream sampling was done by hand and dipnet. At seeps, rocks and logs were overturned in and near wet areas to expose hidden specimens. An additional 49 surveys were completed by Natural Heritage biologists and others within the Resource Areas during 1994 and 1995. The data collected during those surveys has also been included in this report. In addition to surveys, observations of road kills were recorded, as were identified calls and fortuitous sightings by those conducting the surveys or other reliable individuals.

Historical records and earlier surveys indicate the presence of nine species of amphibians and eleven species of reptiles within the survey area. During the period of 1994 through 1998, eight species of amphibians and seven species of reptiles were detected within the boundaries of the Headwaters and Dillon resource areas. Four species of amphibians and three species of reptiles were detected during site surveys in 1996 and 1998. A single Bullfrog (*Rana catesbeiana*), an introduced species, was detected during the same period.

Species detected during the site surveys in 1996 and 1998 included: Spotted Frog (*Rana luteiventris*), Tiger Salamander (*Ambystoma tigrinum*), Western Chorus Frog (*Pseudacris triseriata*), Western Toad (*Bufo boreas*), Painted Turtle (*Chrysemys picta*), Western Rattlesnake (*Crotalus viridis*), and Western Terrestrial Garter Snake (*Thamnophis elegans*). Columbia spotted frog was the most widespread amphibian throughout the area. Western Terrestrial Garter Snake was the most widespread reptile in the area.

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Museum records were received from: American Museum of Natural History, Academy of Natural Science, Brigham Young University, California Academy of Science, Carnegie Museum, University of Puget Sound Museum, Field Museum of Natural History, Glacier National Park Museum, Illinois Natural History Survey, University of Kansas, Los Angeles County Museum, Louisiana State University Museum of Zoology, Museum of Comparative Zoology - Harvard, Milwaukee Public Museum, Montana State University Museum, Michigan State University Museum, North Carolina State Museum of Natural History, Northern Louisiana University Museum, University of Colorado Museum, University of Georgia Museum of Natural History, University of Idaho Museum, University of Michigan Museum, University of South Dakota, United States National Museum of Natural History, University of Texas - Arlington, University of Texas - El Paso, and Peabody Museum - Yale. Most museum data were received with the help of Dr. Charles Peterson, Idaho State University, Pocatello.

Jim Reichel, MTNHP Zoologist, died prior to the completion of this project. Jim was instrumental in organizing this project and conducting a series of amphibian and reptile surveys across Montana, the first comprehensive inventory in three decades. This report represents one of a series of projects that contribute to a baseline inventory of the entire state.

INTRODUCTION

Many amphibians are apparently declining in the western U.S. and worldwide. Acid rain, ozone depletion, pollution by toxic chemicals and heavy metals, predation and/or competition by exotic species, habitat alteration, climatic changes, disease, immune system problems, and combinations of several of these factors have all been suggested as possible causes (Corn and Fogelman 1984, Phillips 1990, Yoffe 1992).

Preliminary data indicate that the Northern Leopard Frog (*Rana pipiens*) has disappeared over much of its former range in western Montana and is declining in at least some areas of eastern Montana. Status and population trends of several toad species (*Bufo* spp.) are unknown, although declines of the Western (*Bufo boreas*) have recently been reported in northern Idaho (C. Peterson pers. comm.), northwestern Montana (Werner and Reichel 1994), Yellowstone National Park (Koch and Peterson 1995) and Colorado (Carey 1993). The Western or Boreal Toad is likely to be reclassified in the near future as *Sensitive* by Region I of the U.S. Forest Service (B. Maxell, pers. comm.). Land-use practices, such as large-scale logging, continue to be detrimental to resident herpetofauna in some regions of the western U.S. (Bury et al. 1991), while the impacts of grazing on amphibians and reptiles and their habitats remain poorly studied and understood. Heavy grazing in and around breeding waters may also negatively impact amphibians and reptiles living in riparian and wetland sites by 1) eliminating emergent vegetation necessary for egg and larval survival, 2) lowering water quality, especially causing high siltation levels, 3) soil compaction and trampling of turtle eggs, and 4) trampling of other eggs, larvae and adults. Additionally, "improving" seeps and springs for livestock watering may make them unavailable to breeding amphibians.

The Montana Natural Heritage Program currently (1998) lists five amphibian and five reptile species as Animal Species of Special Concern. Of these, one amphibian: Northern Leopard Frog (*Rana pipiens*), and two reptiles: Spiny Softshell *(Trionyx spiniferus)*, and Milk Snake *(Lampropeltis triangulum)* are reported to occur in the area.

METHODS AND MATERIALS

The Headwaters and Dillon Resource Areas and the Red Rock Lakes National Wildlife Refuge in southwestern Montana were surveyed during the 1996 – 1998 inventory.

Historical locations of amphibians and reptiles were recorded from literature (see Bibliography) and museum specimen records. Records were received from over 20 major museums which have computerized their collections in North America (see Acknowledgments). Records were also included from 1995 herp surveys conducted by students of San Francisco State College, in the Birch Creek drainage of the Beaverhead National Forest (Miller et al. 1995). Locations derived from these sources have been entered into a database and digitized. Distribution maps were created using survey and sighting data and historical records, including museum specimens.

Survey sites were chosen based on 3 criteria: 1) high priority sites as determined by the BLM and USFWS; 2) location of streams, seeps and wetlands on topographic maps; and 3) accessibility of the wetlands by roads. Based on the above, between three and eight sites per observer were chosen daily for surveys. From 20 to 120 minutes was spent at each site, depending upon the size of the area and what was found. Initially, the entire shoreline, or a major part thereof, was searched by walking slowly along the edge and up into the surrounding vegetation, including rolling over rocks and logs. At regular intervals, the aquatic habitat was sampled for tadpoles or larvae using dipnets. If the initial sampling showed amphibian/reptile species present, further effort was expended in order to get a more comprehensive view of abundance and distribution.

An attempt was made to capture at least the first few individuals of a species seen at a survey site. The species name was recorded along with developmental stage and sex (if possible); the animals were then released. On occasion, representative samples of the more common species in an area were preserved for permanent museum records and will be deposited at the Idaho State University Museum. Water temperature, air temperature, and a general description of the area were recorded. Standard data sheets were used during this project; the amphibian survey data sheet was developed by U.S. Fish and Wildlife Service and is used extensively by a variety of researchers in the western U.S. Much site-specific data was gathered during these surveys; not all data has been analyzed or is presented in this report, but is available from the Montana Natural Heritage Program.

RESULTS AND DISCUSSION

We surveyed 81 sites from April to September in 1996 and in 1998. Of those sites, 50 (62%) had one or more amphibian or reptile species present (Appendix 1). An additional 49 sites were surveyed during May of 1994 and May, July, August, and September in 1995. Twenty-nine of those sites (59%) had one or more amphibian or reptile species present (Appendix 2). Localized areas across the entire region were covered in the inventory (See Map 1, Appendix 3). Although no species were detected at 39% of all sites surveyed, their absence may have been due to the time of day, weather conditions, or other factors at the time of sampling.

During the 1996 and 1998 site surveys on BLM and USFWS administered lands, four amphibian species and three reptile species were detected (Table 1, Table 2). Those species included: Tiger Salamander (*Ambystoma tigrinum*) at 2 sites, Western Toad (*Bufo boreas*) at 7 sites, Western Chorus Frog (*Pseudacris triseriata*) at 5 sites, Columbia Spotted Frog (*Rana luteiventris*) at 32 sites, Painted Turtle (*Chrysemys picta*) at 1 site, Western Rattlesnake (*Crotalus viridis*) at 2 sites, and Western Terrestrial Garter Snake (*Thamnophis elegans*) at 17 sites.

Of the ten species of amphibians presently listed for the area, eight were observed between 1994 and 1998. Those species include: Long-toed Salamander (*Ambystoma macrodactylum*) (20 records), Tiger Salamander (3 records), Tailed Frog (*Ascaphus truei*) (28 records), Western Toad (37 records), Western Chorus Frog (37 records), Bullfrog (1 record), Northern Leopard Frog (7 records), and Columbia Spotted Frog (152 records).

Columbia Spotted frog was the most widespread and numerous amphibian throughout the combined districts. Bullfrog (*Rana catesbeiana*) was reported from only one location in Lewis and Clark County in July 1996. The Bullfrog is not a native species in Montana and is not known to have successfully reproduced in this area.

Two species of amphibians with historical records from the area were not detected in the area during the 1994 – 1998 period. Those species include Woodhouse's Toad (*Bufo woodhousii*) and Plains Spadefoot (*Spea bombifrons*), each with only three historical records. The records for Woodhouse's Toad were in 1948 and 1966. However, the two 1966 Gallatin County specimens have been properly identified as

Western Toad, while the 1948 specimen is still in question. The Plains Spadefoot was collected in 1917 in Park County, 1950 in Gallatin County, and in 1988 in Lewis and Clark County. The identity of those specimens has been confirmed.

There are currently eleven species of reptiles known from the area. Of those, seven were observed in the area between 1994 and 1998. Those species include: Painted Turtle (*Chrysemys picta*) at 10 sites, Rubber Boa (*Charina bottae*) at 5 sites, Racer (*Coluber constrictor*) at 3 sites, Gopher Snake Or Bullsnake (*Pituophis catenifer*) at 11 sites, Western Rattlesnake (*Crotalus viridis*) at 17 sites, Common Garter Snake (*Thamnophis sirtalis*) at 8 sites, and Western Terrestrial Garter Snake (*Thamnophis elegans*) at 75 sites.

Four of the eleven species of reptiles have historical records for the area, but were not detected during the surveys. Those species include Short-horned Lizard (*Phrynosoma hernandesi*) and Sagebrush Lizard (*Sceloporus graciosus*), each with three historical records, and Spiny Softshell (*Trionyx spiniferus*) and Milk Snake (*Lampropeltis triangulum*), each with only a single historical record. Short-horned Lizard has two records from Gallatin County dating from 1903 and 1953 and one undated record from Beaverhead County. Sagebrush Lizard has been reported three times for the area, in 1897, 1951, and 1968. All records are from along the Yellowstone River near Gardiner. There is one record for Spiny Softshell at Canyon Ferry in Broadwater County. However, there is no date assigned to that record and a search of museums has not located the specimen. Milk Snake has one occurrence listed from 1949, near Three Forks in Gallatin County.

Table 1. Amphibian site records from the Headwaters and Dillon resource areas in Montana NHP databases.

Common Name	Species Name	1994-98 total	1996-98 surveys	Total records
Long-toed Salamander	*(Ambystoma macrodactylum)*	20	0	31
Tiger Salamander	*(Ambystoma tigrinum)*	3	2	21
Tailed Frog	*(Ascaphus truei)*	28	0	46
Western Toad	*(Bufo boreas)*	37	7	65
Woodhouse's Toad	*(Bufo woodhousii)*	0	0	3
Western Chorus Frog	*(Pseudacris triseriata)*	37	5	40
Plains Spadefoot	*(Spea bombifrons)*	0	0	3
Bullfrog	*(Rana catesbeiana)*	1	0	1
Northern Leopard Frog	*(Rana pipiens)*	7	0	21
Columbia Spotted Frog	*(Rana luteiventris)*	152	32	222
Total records	**10 Species**	**285**	**46**	**453**

Table 2. Reptile site records from the Headwaters and Dillon resource areas in Montana NHP databases.

Common Name	Species Name	1994-98 total	1996-98 surveys	Total records
Short-horned Lizard	*(Phrynosoma hernandesi)*	0	0	3
Sagebrush Lizard	*(Sceloporus graciosus)*	0	0	3
Painted Turtle	*(Chrysemys picta)*	10	1	14
Spiny Softshell	*(Trionyx spiniferus)*	0	0	1
Rubber Boa	*(Charina bottae)*	5	0	32
Racer	*(Coluber constrictor)*	3	0	13
Milk Snake	*(Lampropeltis triangulum)*	0	0	1
Gopher Snake Or Bullsnake	*(Pituophis catenifer)*	11	0	22
Western Rattlesnake	*(Crotalus viridis)*	17	2	39
Common Garter Snake	*(Thamnophis sirtalis)*	8	0	21
Western Terrestrial Garter Snake	*(Thamnophis elegans)*	75	17	121
Total records	**11 Species**	**129**	**20**	**270**

Species present on the Headwater and Dillon resource areas:

Long-toed Salamander (*Ambystoma macrodactylum*) **AAAAA01080**

Description: Adults are dark gray to black with an irregular (and sometimes broken) green to yellow stripe down the middle of the back. Adult snout-vent length varies from 2 to 3.25". All salamanders have smooth moist skin without scales.

Eggs and Larvae: Egg masses are typically laid in small clusters of 5-100 eggs but may be laid singly (Nussbaum *et al.* 1983); egg masses are typically attached to underwater vegetation or submerged branches. Within the clear gelatinous eggs, the embryos are somewhat light-colored, while frog and toad embryos are dark (except in Tailed Frogs). Larval Long-toed Salamanders are typically brown- or gray-colored, are found in ponds, have three external gills, and are relatively small (<1.75" snout-vent) and slender. They are distinguished from Tiger Salamander larvae by the 9-13 gill rakers on the inside of the 3rd gill arch (17-22 rakers on the Tiger Salamander); they are also smaller and lack the large head and mouth.

Similar species: Adult Long-toed Salamanders can be distinguished from Coeur d'Alene Salamanders by the longest toe on the hind foot which is longer than the sole and a yellow throat patch. Long-toed Salamanders lack a groove running vertically from nostril to mouth.

Habitat and Habits: Long-toed Salamanders are found in a variety of habitats from sagebrush to nearly alpine. They breed in ponds or lakes (very rarely in slow moving streams), usually those without fish present. Adults go to the breeding ponds immediately after snow-melt and are usually the earliest breeding amphibians in western Montana. In the Pacific Northwest, eggs hatch in 3-6 weeks and metamorphosis occurs after 2-14 months (Nussbaum *et al.* 1983, Leonard *et al.* 1993). Individuals were found in the Rocky Mountains and the Elkhorn Mountains from 4350 - 7050 ft. elevation in a survey of the Helena National Forest (Reichel 1996).

Surveying: Larvae can readily be seen in ponds during the day and sampled with a dipnet; egg masses are somewhat harder to see. During the breeding season, adults may also be seen in the water, particularly during night surveys. During the rest of the spring, summer and fall, adults may occasionally be found in and under logs on the forest floor. Metamorphosed individuals are active at night, particularly when it is warm and rainy; they may be captured at this time by either night searches or pitfall traps.

Status: The Long-toed Salamander is the most common salamander in western Montana. The Long-toed Salamander is also found in the northwestern part of the Elkhorns, the farthest east reported location in its range. The Elkhorns are the only isolated mountain range east of the Continental Divide where this species is found (Reichel 1995a).

Montana Natural Heritage Program rank: G5 S5.

Tiger Salamander (*Ambystoma tigrinum*) **AAAAA01140**

Description: Adults have smooth moist skin with a highly variable color pattern; usually the background color is dark, with lighter blotches of yellow, tan or green. The adult is large and heavy-bodied with a snout to vent length of 3-6". Adult Tiger Salamanders can be separated from other Montana species by: 1) their large size and heavy body; and 2) two prominent tubercles on the bottom of each hind foot.

Eggs and Larvae: Egg masses are typically laid in small clusters of 5-120, but may be laid singly (Nussbaum *et al*. 1983, Leonard *et al*. 1993). They are usually attached to vegetation and placed 2-10" below the surface of the water (Hammerson 1982a). Larval Tiger Salamanders are typically pale green or brown-colored, though those living in bentonite clay ponds may be nearly white. They are found in lakes and ponds, have external gills, and are relatively large (0.75-4" snout to vent) and heavy-bodied.

Similar species: Idaho Giant Salamanders in western Montana. None in eastern Montana.

Habitat and Habits: Tiger Salamanders in eastern Montana are primarily associated with prairie or agricultural habitats. They are also found in wooded draws and ponderosa pine forests (Reichel 1995b, Hendricks and Reichel 1996). They breed in ponds or lakes, usually those without fish present. In arid areas, they may also be found in springs, intermittent streams, and stock ponds. Adults spend much of the day in rodent burrows, becoming active on the surface at night. Adults may be active relatively late in the year.

Surveying: Larvae and eggs may be seen in ponds during the day and may be sampled with a dipnet. Migrations of hundreds or thousands of newly transformed adults are occasionally seen in mid-late summer or early fall. During the breeding season, adults are often seen moving to or away from the water or breeding in it. Pitfall and minnow traps may be used to capture adults at this time. Throughout the rest of the summer adults are difficult to find; using pitfall traps or driving roads on warm rainy nights may be the best techniques then.

Status: The only salamander in eastern Montana. The species is widespread and probably more abundant than survey records indicate.

Montana Natural Heritage Program rank: G5 S5.

Tailed Frog (*Ascaphus truei*) **AAAAA01010**

Description: Adults are gray or brown with gray, brown, or occasionally yellow blotches; the skin has a distinctly bumpy texture. The adult has a snout-vent length of 1.5-2" and lacks a tympanum. The outer toe of the hind foot is broader than the other toes. The male has a bulbous "tail" which acts as a penis.

Eggs and Larvae: Approximately 50 eggs are laid in bead-like strings attached to the underside of rocks. The tadpole (up to 2" long) is unique in that it has a large mouth modified into a sucker; the color is quite variable.

Similar species: No other frog or toad has the outer toe of the hind foot broader than the other toes; all other frogs and toads have a tympanum behind each eye.

Habitat and Habits: Tailed Frogs are found in and along small, swift, cold mountain streams. In the Cascade Mountains of Washington and Oregon, the Tailed Frog appears to be very sensitive to siltation and frequently disappears in and downstream from clearcuts and water diversions (Bury, pers. comm.). Preliminary findings do not indicate that this is the case in Montana. Eggs are laid during the late summer and take approximately four weeks to hatch. Tadpoles take 1-4 years to metamorphose, depending on water temperature (Nussbaum *et al.* 1983; Metter 1967). Sexual maturity in Montana is attained at ages 6-7, (Daugherty and Sheldon 1982) which is the latest age for sexual maturity of any North American amphibian.

Surveying: Tadpoles are frequently found while electro-shocking fish. They may also be found by turning over rocks in rapid water, with a net held just downstream. Adults are best found by walking up streams starting 30-60 minutes after dark.

Status: Tailed Frogs should be considered a species with a very localized distribution in Montana. However, the species may be more common and widespread in suitable habitat than is currently known. It should be looked for throughout its potential range. It is common and widespread in northwestern Montana (Reichel and Flath 1995, Werner and Reichel 1994, 1996). Previously it was a USFWS Candidate species (C-2). We would recommend that all sightings of this species be reported.

Montana Natural Heritage Program rank: G5 S3S4.

Western Toad [= Boreal Toad] (*Bufo boreas*) **AAAAA01140**

Description: Adults are colored with a gray, brown, or olive-green mottling and a prominent white or yellowish line down the center of the back; very young transformed toads typically lack the dorsal line, and the warts are often red-brown in color. The pupils are horizontal. The adult has a body length of 2.5-5". There are no cranial crests and the skin is relatively dry with many warts and glands present.

Eggs and Larvae: Eggs are laid in long, clear, double strings, and each has a black embryo. Tadpoles are typically jet black, while all mid- to large-sized frog tadpoles in Montana are green or bronze (except for some Tailed Frogs); very small frog tadpoles are also black.

Similar species: Other Montana toads have cranial crests between their eyes. The Plains Spadefoot has one tubercle on the sole of the hind feet, a vertical pupil, and smoother skin. NOTE: It is very difficult to distinguish among the four Montana toad species eggs, larvae, and recently-transformed toadlets.

Habitat and Habits: Adults are largely terrestrial and found in a variety of habitats from valley bottoms to high elevations; they breed in lakes, ponds, and slow streams with a preference for shallow areas with mud bottoms. Breeding and egg laying in Montana usually takes place 1-3 months after snow-melt, from April at lower elevations to July at higher sites. Tadpoles are typically 2-3 months old at metamorphosis in Montana, depending on water temperature (Black 1970). Following metamorphosis, hundreds of small toads, many with the tails still present, can be found on the shores of breeding ponds.

Surveying: Tadpoles are easily seen in ponds during the day and can be sampled with a dipnet. During the breeding season, adults may be seen in the water but at other times are found in more terrestrial habitats.

Status: The rarity of this species and lack of recent sightings in the eastern ranges is of concern. Brunson (1952) regarded the Western Toad as one of the most common batrachians (frogs and toads) in western Montana. Black (1970) supported its common occurrence not only in the west, but also in many counties east of the continental divide. The Western Toad has declined from the most common anuran in western Montana, to a relatively rare one in the state in the past 25 years (Reichel and Flath 1995, Werner and Plumber 1995, Werner and Reichel 1994, 1996).

The U.S. Fish and Wildlife Service now lists this species as a Candidate (C-1) species in Colorado, Wyoming, and New Mexico. Apparent declines have recently been reported in northern Idaho (C. Peterson pers. comm.), Yellowstone National Park (Koch and Peterson 1995, Peterson *et al.* 1992), Wyoming, and Colorado (Carey 1993). We would recommend that all sightings of this species be reported and that a monitoring program be set up for this species.

Montana Natural Heritage Program rank: G4 S3S4.

Woodhouse's Toad (*Bufo woodhousii*) **AAABB01180**

Description: Adults have dry skin with small warts, and are gray, brown, or olive-green with paler mottling or spots. A prominent white or yellowish line runs down the center of the back; very young transformed toads typically lack the dorsal line, and the warts are often red-brown in color. Woodhouse's Toad has parallel cranial crests between the eyes and post-orbital crests connecting to them at a right angle behind the eyes; the post-orbital crests typically touch the parotoid glands. If a lump-like boss is present on the snout, it does not extend back between the eyes. The pupils are horizontal. The adult has two black tubercles on the hind feet and a body length of 2.5-4".

Eggs and Tadpoles: Similar to those of the Western Toad.

Similar species: The Western Toad lacks cranial crests. The Great Plains Toad has large, white-bordered, dark, dorsal blotches. The Canadian Toad has a lump between the eyes; frequently the parotoid gland is separated from the post-orbital crest which may be broken or absent. NOTE: It is very difficult to distinguish among the four Montana toad species eggs, larvae, and recently-transformed toadlets.

Habitat and Habits: Adults are partially terrestrial but often found near water. They are usually found in irrigated agricultural areas and flood plains, rather than the more upland areas used by Great Plains Toads (Bragg 1940, Timkin and Dunlap 1965, Black 1970). They are most active at night, although they may at times be found feeding during the day (Hammerson 1982a). They typically breed in permanent lakes, ponds, reservoirs, and slow streams, with a preference for shallow areas with mud bottoms (Black 1970, Hammerson 1982a, Baxter and Stone 1985). Breeding and egg laying is spread out over the spring and early summer, with known dates from Montana ranging from 4 May to 1 July (Black 1970).

Surveying: Adults may easily be found by using their loud calls for identification on warm (>54° F) nights; calling peaks during the first few hours after sunset (Hammerson 1982a). "Road hunting" on warm nights may also be effective. Eggs and tadpoles are seen in ponds during the day and can be sampled with a dipnet; however, identification of toad eggs and tadpoles ranges from difficult to impossible in the field.

Status: Woodhouse's Toad is relatively common in southeastern Montana, however, its status elsewhere in the state is unclear. Geographic and habitat relationships with other toads in Montana are not well known. It should be watched for at low elevations in prairie or shrub-steppe habitat; it could occur along the Missouri River. Any located should be well documented with a description indicating how the species was differentiated.

Montana Natural Heritage Program rank: G5 S4.

Western Chorus Frog (*Pseudacris triseriata*) **AAABC05070**

Description: Adults are very small (0.75-1.5") and have tiny, almost unnoticeable toe pads. They have a dark line extending from the snout through the eye to the groin. Basic coloration is quite variable with the background color being green, brown, gray, or reddish. Typically 3-5 dark longitudinal stripes are present on the head and back which may be broken up into spots on some individuals.

Eggs and Tadpoles: Eggs are laid in small clusters of 10-100, usually less than 1" across and attached to submerged vegetation (Wheeler and Wheeler 1966, Baxter and Stone 1985). Individual eggs are about 1 mm in diameter. Tadpoles are brown/bronze and the eyes are located on the sides of the head.

Similar species: Pacific Chorus Frogs (*Pseudacris regilla*) have obvious toe pads and an eye stripe ending at the shoulder. Recently metamorphosed Ranid frogs could be confused with this species but the coloration differs and the tiny toe pads are lacking (often visible only with a magnifying glass on small chorus frogs).

Habitat and Habits: Western Chorus Frogs are regularly found in the water only during the breeding period in spring. Their presence is obvious during this time due to their call which is given frequently at night and sporadically throughout the day. Following breeding, these frogs move into adjacent uplands and are rarely seen. In eastern Montana they breed in temporary ponds and small lakes surrounded by prairie; in some locations in Montana they are also found in open forested habitats. Eggs hatch in about 2 weeks and tadpoles are about 2 months old at metamorphosis (Wheeler and Wheeler 1966, Nussbaum *et al.* 1983).

Surveying: Adults are easily surveyed for, using their calls for identification during the breeding season in the spring and early summer. During the breeding season, adults may also be seen in the water, but their small size and habit of freezing or diving when disturbed makes observation difficult; night surveys may be more productive. Egg masses are difficult to find. Tadpoles may be seen in ponds during the day and can be sampled with a dipnet.

Status: Common throughout the prairies of eastern Montana.

Montana Natural Heritage Program rank: G5 S5.

Plains Spadefoot (*Scaphiopus [=Spea] bombifrons*) **AAABF02010**

Description: Adults are colored gray or brown with darker mottling on the back and a white belly. Some individuals have indistinct longitudinal streaking. The pupils of the Plains Spadefoot are vertically elliptical and there is a high, hard lump between the eyes. Its skin is less warty than true toads. The adult has a single tubercle on the hind feet and has a body length of less than 2.5".

Eggs and Tadpoles: Oval egg masses of 10-250 eggs are attached to underwater plants or debris. Tadpoles are mottled sooty and olive-yellow above and paler below with gold metallic flecking over all; iris is gold.

Similar species: Other Montana frogs and toads have round or horizontally elliptical pupils.

Habitat and Habits: Adults are found in grassland and sagebrush areas, particularly in areas with sandy or loose soil (Wheeler and Wheeler 1966, Hammerson 1982a, Baxter and Stone 1985). Except during breeding, they are seldom found in the water. They are primarily nocturnal and emerge from their burrows only following heavy rains. They breed in shallow temporary pools usually following heavy spring or summer rains (Hammerson 1982a). Males call loudly, with groups being heard for up to a mile. Eggs hatch after 2-3 days and tadpoles transform in 6-10 weeks (Wheeler and Wheeler 1966, Hammerson 1982a).

Surveying: Adults may be easily found by using their calls for identification when breeding at night or by "road hunting" on warm, rainy nights. Calling normally takes place only when the temperature is >50° F (Hammerson 1982). Tadpoles are seen in ponds during the day and can be sampled with a dipnet. Surveying is complicated by the long time periods which this species spends underground, especially during droughts.

Status: Locally common in eastern Montana; there are large gaps in the known range. It should be watched for at low elevations in prairie or shrub-steppe habitat. Any located should be well-documented.

Montana Natural Heritage Program rank: G5 S4?

Bullfrog (*Rana catesbeiana*) **AAABH01070**

Description: The largest of North American frogs, adult Bullfrogs may reach 8 inches in body length. The skin is smooth. Adults are usually pale to dark green or brownish green with darker spots or blotches. There are a series of black bands across the legs. The underside is cream to yellowish with gray mottling. No dorso-lateral folds are present, however there is a prominent ridge running from the eye over the tympanum to the shoulder. Males have extensive yellow pigment on the underside, especially in the throat region, and swollen thumbs. The diameter of the tympanum is larger than the diameter of the eye in males but about the same size in females.

Eggs and Tadpoles: Egg masses are a 1-2 egg thick film of thousands of eggs and may reach several feet across. Tadpoles may reach 4.5" in total length and are olive green with numerous black spots dorsally; the belly is white to creamy with varying amounts of dark mottling.

Similar species: Other Montana Ranid frogs have dorso-lateral folds.

Habitat and Habits: Bullfrogs are rarely seen far from the water's edge and are usually in the water. They are associated with larger bodies of quiet water such as ponds, lakes or backwaters of streams, usually with extensive emergent vegetation such as cattails or reeds. They emerge in the spring only after air and water temperatures have warmed considerably and insect populations are beginning to proliferate. Breeding takes place in June when males attract females to their territory by a series of very deep, loud "brr-umps." The large egg mass tends to float on the surface when first laid, but sink into the water prior to hatching (Hammerson 1982a, Nussbaum *et al*. 1983). Tadpoles over-winter in the Pacific Northwest, transforming during their second summer (Nussbaum *et al*. 1983, Leonard *et al*. 1993). The bullfrog is a voracious feeder, eating anything smaller than itself, including ducklings, fish, mice, frogs, and small turtles. Bullfrogs have been implicated in extirpations of native frogs and turtles, and declines in waterfowl production (Hammerson 1982b, Leonard *et al*. 1993, Kiesecker and Blaustein 1998).

Surveying: Tadpoles and adults can easily be detected visually or sampled by using a dipnet; both may be found from spring through fall. Capture success of adults is enhanced by night sampling using a headlamp, as they are very wary and do not allow close approach during the day. Eggs are also easy to detect when laid in the early summer.

Status: Bullfrogs are native to the eastern and central U.S. and have been introduced to the western states. It is possible that several unauthorized releases have occurred on private lands, based on conversations with ranchers. They were introduced into western Montana prior to the mid-1960's (Black and Bragg 1968). Bullfrogs should be watched for in ponds, lakes, sloughs, or slow streams. Any located should be well documented.

Montana Natural Heritage Program rank: G5 SE4.

Northern Leopard Frog (*Rana pipiens*) **AAABH01170**

Description: Adults are brown or green with large, dark spots surrounded by light-colored halos on the sides and back. The dorso-lateral folds (ridges along the sides of the back) are usually lighter in color that the surrounding background. The under-side is typically white, but may be cream-colored or yellowish. The adult has a body length of 2-5". Newly transformed froglets may lack spots and are about 1" in length (Leonard *et al.* 1993).

Eggs and Tadpoles: Eggs are laid in 2-5" globular masses composed of hundreds to thousands of eggs (Hammerson 1982a, Nussbaum *et al.* 1983). The tadpoles are brown to dark brown on top with some metallic flecking, whereas the underside is often nearly transparent (Nussbaum *et al.* 1983). Total length of tadpoles may reach more than 3"; the eyes are located on top of the head.

Similar species: None, although some newly-transformed froglets may lack spots, which makes them extremely difficult to distinguish from Spotted and Wood Frogs.

Habitat and Habits: Northern Leopard Frogs are found in or near water in non-forested habitats. Vegetation is typically dense, as in a cattail marsh or dense sedge-meadow. Breeding takes place in lakes, ponds (temporary and permanent), springs, and occasionally backwaters or beaver ponds in streams. In Colorado, eggs hatch in 4-15 days and tadpoles take 8-15 weeks to metamorphose, depending on water temperature (Hammerson 1982a).

Surveying: Both adults, tadpoles, and eggs are easily seen in and along the water during the day and can be sampled with a dipnet; adults may also be captured by hand. At very low densities adults may be difficult to find and may be detected using a call recorder. Tadpoles are difficult to tell from those of the Spotted Frog in areas where the two species may overlap.

Status: Historically, the Northern Leopard Frog was widespread in Montana but it now appears to be extinct throughout much of the western part of the state. It is still common and widespread in the southeastern corner of the state, but it may be declining in central and northeastern Montana. It appears that only localized populations are present on the western edge of the plains. Given the recent declines in this species and the unusual habitat, this record should be treated as hypothetical until verified. Due to its significant decline and lack of current reports from the HNF, all sightings of this species should be documented.

Northern Leopard Frogs are now absent from many other areas in North America where they were common a few decades ago. Widespread extinctions are known from Alberta (Koonz 1993), Wyoming (Koch and Peterson 1995), Colorado (Hammerson 1982b, Corn and Fogelman 1984), Idaho (Groves and Peterson 1992), Washington, and Oregon (Leonard *et al.* 1993). Bullfrog and fish introductions, acid rain, ozone depletion, immune system suppression, and "Postmetamorphic Death Syndrome" have all been suggested as causes for frog extirpations in other areas (Corn and Fogelman 1984, Hammerson 1982b, Carey 1993, Leonard *et al.* 1993).

Montana Natural Heritage Program rank: G4 S3S4.

Columbia Spotted Frog (*Rana luteventris [= pretiosa]*) **AAABH01290**

Description: The adult has a snout-vent length of 2-4". Adults are dark to light brown, gray, or olive green with dark spots (frequently with lighter centers) found on the back, sides and legs. The number and pattern of spotting is quite variable. The back and sides are often covered with small bumps. The underside of the legs is bright red, salmon, or orange; this bright color may extend up to the chin or be replaced by a light, mottled gray on the chin, chest, and/or belly. In younger subadults, bright leg color is often lacking and instead a light, lemon-colored wash is present. In these subadults, there is often a dark mask present, with a light jaw stripe extending to the shoulder; both the mask and jaw stripe may be less obvious in larger, older animals.

Eggs and Tadpoles: Eggs are laid in large, globular masses of 150-500 at the surface of the water. The tadpoles are dark green to brown on top with some gold flecking whereas the underside has an iridescent bronze or silver color. Total length of tadpoles may reach 3"; the eyes are located on top of the head.

Similar species: The bright-colored pigment on the undersides of the adult's legs distinguish this species from all other frogs in Montana. Younger individuals, without colored legs, may usually be distinguished from other frogs by a combination of: 1) dorsal spots usually present but not surrounded by light-colored halos; 2) dorso-lateral folds present; 3) toes without pads at the tips; and 4) a pale gray, (rather than white) belly.

Habitat and Habits: Spotted Frogs are regularly found at the water's edge in openings within forest habitats. Wetlands in or near treeline are also used, but populations are uncommon in the large, open intermountain valleys. Eggs hatch in 2-3 weeks and tadpoles take 2-14 months to metamorphose, depending on water temperature (Nussbaum *et al.* 1983, Turner 1958). Breeding takes place in lakes, ponds (temporary and permanent), springs, and occasionally backwaters or beaver ponds in streams. All the egg masses in a particular pond are often found in the same location at the margin of the pond; therefore, the eggs are susceptible to drying up if pond levels recede substantially before hatching. Young and adult frogs often disperse into marsh and forest habitats but are not usually found far from open water.

Surveying: Adults, tadpoles, and eggs are easily seen in and along the water during the day and can be sampled with a dipnet; adults may also be captured by hand. Many adults may leave the breeding ponds following egg laying and move to nearby feeding areas for the summer. Tadpoles are difficult to distinguish from those of the Northern Leopard Frog in areas where the two species may overlap.

Status: The most common frog in western Montana. The species was previously a U.S. Fish and Wildlife Service Category 2 Candidate species in Montana; elsewhere in its range it is listed as a C-1, with Threatened/Endangered status warranted, but precluded by work on higher-priority species (U.S. Fish and Wildlife Service 1993). While significant declines are known from the southern end of the range (Nevada, southern Idaho, Utah) and are also apparent in coastal Washington (McAllister *et al.* 1993), Oregon, and California, recent (as yet unpublished) research indicates that those populations are different species.

Montana Natural Heritage Program rank: G4 S4.

Short-horned Lizard (*Phrynosoma douglasi*) **ARACF12030**

Description: The Short-horned lizard has a broad, somewhat flattened body and relatively short limbs and tail. It is generally tan to gray with dark and light spots and blotches; the belly is white. There is a distinctive line of pointed scales along each side, and the head has short, blunt "horns" pointing backward. Adult lizards range from 1.7 - 5.5" in length.

Young: Young are live-born and resemble small adults.

Similar species: None.

Habitat and Habits: The Short-horned lizard is found in a variety of habitats, including dry open forests, grasslands, and sagebrush; the soil is usually loose or sandy. In firmer soil situations, it may use the burrows of other animals. It is active during the day, typically with the peak of activity in mid-late morning. A Short-horned Lizard may squirt blood from its eyes when disturbed. Little is known about reproduction in this part of the range; young are born in late summer. Ants are the primary food of the species.

Surveying: They may be surveyed for by slowly walking through appropriate habitat and watching carefully for them; look carefully near ant mounds; this technique has low success with Short-horned Lizards however. As with many lizards and snakes, they are easily missed. Carefully documented incidental observations may provide the best clues to their distribution. They may be also taken in pitfall or funnel traps in combination with drift fences.

Status: The Short-horned Lizard subspecies found in Montana (*P. d. brevirostra*) is currently a U.S. Fish and Wildlife Service Category 2 Candidate species (U.S. Fish and Wildlife Service 1994). It is widely distributed (but apparently localized) in eastern Montana. This species may be vulnerable to collecting for the pet trade and agricultural conversion of native habitats. It should be watched for in open pine, prairie, or shrub-steppe habitat with loose or sandy soils; all sightings should be documented.

Montana Natural Heritage Program Rank: G5 S4. A Species of Special Concern.

Sagebrush Lizard (*Sceloporus graciosus*) **ARACF14030**

Description: The Sagebrush Lizard is small (1.5 - 2.5" body length) and narrow-bodied. The color pattern in adults consists of alternating dark and light stripes running down the back. The colors are typically brown, gray, and cream. Males have mottled blue throat patches and bright blue belly patches, while females are white or yellow below (Censky 1986). The body and tail scales appear somewhat spiny.

Eggs and young: There are 2 - 7 tough, leathery, white eggs in a clutch, averaging about 7.5 x 12 mm (Nussbaum *et al*. 1983). Body length of hatchlings is about 25 mm, and coloration is similar to adults.

Similar species: None in Montana. The Short-horned Lizard has a wide body.

Habitat and Habits: Sagebrush Lizards are found primarily in sagebrush areas, but also occur in open forests and brush lands; they are found in both areas of fine soils and rocky outcrops (Hammerson 1982a, Baxter and Stone 1985, Nussbaum *et al*. 1983). In the Yellowstone area, they are found near thermal features (Mueller 1969). They are active during the day, with mid-morning and late-afternoon peaks of activity (Hammerson 1982a). Females lay eggs in loose or sandy soil in early summer and the young hatch in late summer. They feed primarily on insects and other arthropods.

Surveying: They may be surveyed for by slowly walking through appropriate habitat on warm, sunny days and carefully watching for them; this technique is very effective for the Sagebrush Lizard. However, as with many lizards and snakes, they may be overlooked if conditions are not correct. Carefully documented incidental observations provide excellent clues to their distribution. They may be captured with a pole and noose or may be also taken in funnel traps with drift fences. Adults and juveniles have been captured inadvertently in pitfall can traps set for shrews (P. Hendricks, pers. observ.). Mark-recapture methods offer the best opportunity for determining population status.

Status: The Sagebrush Lizard was a former U.S. Fish and Wildlife Service Category 2 Candidate species (USFWS 1994). It is apparently locally common in southern Montana, from Yellowstone Park eastward to at least Chalk Butte in Carter County. They are known from the western border of South Dakota south of Harding County (C. R. Peterson pers. comm., Stukel and Backlund 1997), and two disjunct populations are known from the western edge of North Dakota (Censky 1986). This species should be watched for, and any animals located should be documented.

Montana Natural Heritage Program rank: G5 S4.

Painted Turtle (*Chrysemys picta*) **ARAAD01010**

Description: Adult Painted Turtles have a relatively flat dorsal shell, or carapace, the length of which may reach 9" in females and 7" in males. The background color of the shell may be dark brown, olive, or black. A series of short, irregular yellow lines are often scattered across the shell, and a red and black border forms the outer edge. The ventral shell, or plastron, is red with a centrally-located yellow and black blotch with edges flaring out along the border of the scutes. The edge of the plastron also has a series of black and yellow blotches. The head, neck, and legs are marked with yellow lines and a red spot appears behind the eye. Very dark colored individuals are occasionally found. Males are distinguished by longer front claws and longer tails with the anus posterior to the margin of the carapace (Ernst *et al.* 1994).

Eggs and Young: The elliptical, white, soft-shelled eggs are about 28-35 mm in length and 16-23 mm in width (Ernst *et al.* 1994). They typically number 6-23 per clutch. Coloration of young Painted Turtles is more vibrant and the shell is not quite as flattened as adults.

Similar Species: None.

Habitat and Habits: Painted Turtles are active during the day and are rarely seen far from ponds, lakes, or the slow-moving water of streams. Adults are primarily herbivorous, feeding on a variety of aquatic plants, but will also scavenge on animal remains. Eggs are usually laid within 10-20 feet of the water's edge, although some individuals will travel up to 600 m seeking a suitable site. During egg-laying, the female excavates a hole with her hind feet and deposits the eggs, which are then covered by several inches of dirt. Predation on turtle eggs by raccoons, skunks, etc. is common, and shell fragments are evidence of such activity. Female Painted Turtles may lay more than one clutch of eggs each summer. Young borne of late egg depositions overwinter in the nest and do not emerge until the following spring (Ernst *et al.* 1994). Once females lay their eggs, they return to the pond, where they can often be seen basking on logs or rocks along with juveniles and males. Painted Turtles are sexually mature at 3-5 years of age and may live to be 30 years or older (Ernst *et al.* 1994).

Surveying: Although various turtle traps can be used for surveys, visual identification is suitable for presence/absence studies since the three turtle species in Montana are easily distinguished. Basking peaks at different times during the day, depending on season and location; in the northern states and Canada it generally peaks in the morning. Surveys should be done on sunny days with a pair of binoculars. During cold or cloudy weather, turtles tend to remain underwater for long periods and can be missed on a walk-through survey.

Status: Painted Turtles are locally quite common in Montana at lower elevations. They are known from lower elevation areas on the plains; any sightings should be documented. There has been some concern about Painted Turtle populations nationally; whether declines have occurred in Montana is unknown

Montana Natural Heritage Program Rank: G5 S5.

Spiny Softshell (*Trionyx spiniferus*) (=*Apalone spinifera*) **ARAAG01030**

Description: Spiny Soft-shells have flexible, leathery shells. The carapace is olive-gray, marked with dark spots. The plastron is white or light cream-colored. Female carapace length is up to 18 inches or more, whereas males are typically 6-8 inches. The nostrils are terminal, allowing this turtle to remain entirely beneath the surface and take air through its "snorkel".

Eggs and Young: The nest is a flask-shaped excavation containing 4-39 (typically 12-18) hard-shelled, spherical, white eggs. The individual eggs range in size from 24-32 mm in diameter and average about 28 mm. Hatchlings resemble adults and are 30-40 mm in shell length (Ernst *et al.* 1994).

Similar Species: None.

Habits and Habitat: Spiny Softshells are active during the day. This highly aquatic turtle is found in rivers or their connecting backwaters with muddy or sandy bottoms. Unlike other Montana turtles, they do not move overland from one water body to another. Mud and sand banks and bars are used for both basking and nesting. Hibernation takes place beneath the water, usually beneath 5-10 cm of bottom substrate (Ernst *et al.* 1994). The retracted head and neck combines with the profile of the shell to produce a wedge shape, which allows this turtle to escape by literally diving into the bottom mud. If necessary, additional strokes of the legs will completely bury it in the substrate, hidden from view. Food items include fish, crayfish, frogs, toads, aquatic insects, and carrion. Spiny Soft-shells have a surprisingly long, agile neck and can inflict a painful bite. They can be safely handled by grasping the shell on each side between the front and rear legs with the head pointing *away* from the captor.

Surveying: Although various turtle traps can be used for surveys, visual identification is suitable since the three turtle species in Montana are easily distinguished . A pair of binoculars is helpful and surveys should be done on warm sunny days; basking seldom takes place before 10:00 a.m. (Ernst *et al.* 1994). During cold or cloudy weather, turtles tend to remain underwater for long periods and can be missed on a walk-through survey. Care should be taken to watch for the snorkel-like nostrils projecting just above the surface of the water.

Status and Distribution: Found mainly in the Yellowstone and Missouri Rivers and their major tributaries. These populations may be separated from each other and are believed to be disjunct form the population in South Dakota (Ernst *et al.* 1994); they have not been reported from North Dakota (Wheeler and Wheeler 1966). The Missouri River population is known from the tail of Fort Peck Reservoir upstream to the first dam above, and from most of the Mussellshell River; their presence on other tributaries is presently unknown. Considered a Species of Special Concern in Montana.

Montana Natural Heritage Program Rank: G5 S3. Species of Special Concern.

Rubber Boa (*Charina bottae*) **ARADA01010**

Description: The Rubber Boa looks and feels like rubber, hence its name. It is a small snake (14-33" length), stout, and uniformly-colored either brown or green on the dorsal side. The ventral surface is cream to tan in color. The scales are small and smooth, except for those on the head which are enlarged. The tail is short and blunt and the eyes are very small. It is a very slow moving snake which can easily be caught if detected.

Young: Rubber Boas are born alive and young are more tan (or even pinkish) than the adults on both the dorsal and ventral surfaces.

Similar species: The Racer is much quicker and more active, has larger eyes, and a thin, tapered (not blunt) tail.

Habitat and Habits: The Rubber Boa is a secretive, slow-moving, docile snake, usually found under logs and rocks in either moist or dry forest habitats, but rarely in marsh or bog situations. Denning locations are typically in areas with fractured rock on south facing slopes; recent data indicates it rarely moves more than a short distances from its den (C. Peterson pers. comm). Occasionally this snake is seen sunning itself on a road, trail, or open area, but it is primarily nocturnal. Feeding is primarily on small mice, but also on shrews, salamanders, snakes and lizards. Two to eight young are born alive in late summer or early fall.

Surveying: There are no practical methods for surveying other than systematic searches of a given area rolling over rocks, logs, etc. Driving roads at night, particularly after a rain when the temperature is > 50° F, may be more effective, especially on roads which follow a stream. Previous sightings are of value in locating general areas of activity and denning sites. Funnel traps may be effective.

Status: Sightings of Rubber Boas are infrequent, but they are widely distributed and probably common throughout western Montana at low to mid-elevations. Of particular interest would be any documentation of denning sites.

Montana Natural Heritage Program Rank: G5 S4.

Racer (*Coluber constrictor*) **ARADB07010**

Description: A slender, but moderately long snake, the Racer ranges from 20-65 inches in length. Adult coloration is uniform across the dorsal side but it can vary from a greenish-gray to brown or blue. The ventral side is whitish to pale yellow, the latter color extending onto the upper lip scales and nasal region. The eyes are relatively large. The scales are smooth and the nostril is bordered by two scales.

Young: Snakes (up to about 20") have a much different coloration than the adults consisting of a series of dorsal brown blotches edged with black which run the length of the animal; a row of blotches is also found on each side of the animal extending onto the ventral side.

Similar species: Young Gopher Snakes may be distinguished by the keeled rather than smooth scales of the young Racer. Young Western Hognose Snakes have an upturned nose. Smooth Green Snakes are smaller and colored bright grass-green and whitish below; their nostrils are centered in single scales. Also see Rubber Boa.

Habitat and Habits: The Racer is associated with open habitats, in shortgrass, shrub-steppe, or forested areas (Hammerson 1982a, Baxter and Stone 1985). It is often found near water and rocks. The Racer is an extremely fast and agile snake. A clutch of perhaps 3-7 eggs is laid in the summer (Stebbins 1985). It preys on insects and small vertebrates such as mice and frogs.

Surveying: They may be surveyed for by slowly walking through appropriate habitat on warm, sunny days and carefully watching for them; this technique is moderately effective for the Racer. However, as with many lizards and snakes, they may easily be missed. Carefully documented incidental observations may provide the best clues to their distribution. They may be also taken in funnel traps with drift fences. Mark-recapture methods offer the best opportunity for determining population status.

Status: The Racer can be expected at low to mid-elevations across Montana. Any sightings should be documented. Of particular interest would be documentation of any den sites.

Montana Natural Heritage Program Rank: G5 S5.

Milk Snake (*Lampropeltis triangulum*) **ARADB19050**

Description: The Milk Snake is a slender and medium-sized snake (to 42 inches in length or more), with smooth scales. It has a Highly recognizable series of red to orange saddles or rings that are bordered by black bands and separated by white or yellow bands. Width of dark and light bands can vary markedly. The subspecies in Montana (*L. t. gentilis*) tends to be paler, with orange bands replacing red, and a light belly with few or no black spots.

Similar species: None in Montana.

Habitat and Habits: Little is known of Milk Snakes in Montana because only a few have been reported. In Wyoming and elsewhere they are usually found near cliffs, talus, outcrops, and rocky hillsides in forested and open country (Baxter and Stone 1985). They can be found in or under rotten logs. Milk Snakes are secretive and most active at night. They eat a variety of vertebrates, including other snakes, lizards, eggs, small mammals, and sometimes invertebrates such as earthworms and insects. Eggs are laid in mid-summer. Milk Snakes sometimes vibrate their tails when disturbed. Their name stems from an old tale alleging that these snakes milk cows.

Surveying: Timed site surveys can be conducted around cliff bases and outcrops. Nocturnal surveys may be the most productive. Most distribution information will likely come from recording incidental sightings. More intensive research may be done using funnel traps in combination with drift fences. The most intensive research and survey projects may use mark-recapture or radio-telemetry techniques.

Status: Milk Snakes are very rare and local in Montana. The majority of records are clustered at only a few sites in Montana, such as near Bridger in Carbon County, and Billings in Yellowstone County. The subspecies found in Montana is highly sought for the pet trade. All records of Milk Snakes should be fully documented. Of special interest would be documented denning sites.

Montana Natural Heritage Program rank: G5 S2. Species of Special Concern.

Gopher Snake (*Pituophis catenifer [=melanoleucus]*) **ARADB26010**

Description: Montana's largest snake, the adult Gopher Snake (also called Bullsnake or Pine Snake) can reach a total length of 7 feet, but most specimens seen in western Montana range between 3-5 feet. It is readily recognized by a series of large black to brown blotches which run down the back, and another series along the sides. The blotches, which are set on a yellow background, become more widely spaced and darker towards the tail. The dorsal scales are keeled. There is usually a black band on the head located in front of and extending below the eyes. The ventral coloration is yellow to white, often spotted with black, and the anal plate is undivided.

Eggs and Young: Gopher Snakes lay between 2-24 eggs during the summer months (Hammerson 1982a). The young resemble adults in coloration.

Similar species: Young Racers have a black border on dark blotches and the scales are not keeled. Young Western Hognose Snakes have an upturned nose. Western Rattlesnakes have a rattle on their tail and triangular shaped heads.

Habitat and Habits: Gopher Snakes are associated with dry, arid habitats including grassland, shrub-steppe, and open pine forest. They feed on rodents, rabbits and ground dwelling birds, and to a lesser extent on frogs, toads, etc., found around stock ponds and other wetlands. They have a habit of hissing and vibrating the tail when alarmed, often sounding like rattlesnakes. They occasionally climb trees, hence the common name "Pine Snake."

Surveying: Walk-through surveys, done on a regular basis in warm, sunny weather probably give the best results without resorting to trapping techniques. They are most easily found near dens in the spring and fall. Funnel trapping is effective and they may occasionally be found by night driving during the mid-summer. Data can be enhanced by mark-recapture techniques.

Status: Documentation of any denning sites would be of particular interest.

Montana Natural Heritage Program Rank: G5 S5.

Western Rattlesnake (*Crotalus viridis*) **ARADE02120**

Description: Rattlesnakes have a heat-sensing pit located between the nostril and the eye. The fangs are hollow and hinged, allowing them to be folded back against the roof of the mouth. The head is triangular in shape and blunt-nosed. The eyes are slightly elevated. There are several white lines which run along the side of the head. Adult Western Rattlesnakes have a narrow neck but a stout body with total length ranging from 15-60 inches. The dorsal background color varies from pale green to brown with a series of brown or black blotches edged with a dark and then light line extending the length of the body. The blotches often merge into rings on the tail. There are also blotches on the sides of the body. The ventral side is pale yellow to white and without blotches. The scales are keeled. The tail ends in a rattle which helps to warn potential predators of the snake's presence. The young have the same color pattern, but are brighter in color than adults.

Similar species: No other snake in Montana has rattles, but see Racer, Gopher Snake and Western Hognose Snake which may have similar color patterns.

Habitat and Habits: The Western Rattlesnake is an inhabitant of more open and arid country but it is also found in Ponderosa pine stands or mixed grass-coniferous forests. It is more likely to be encountered on south-facing slopes and areas of rock outcrops. It is feared and often needlessly killed due to its poisonous bite. Rattlesnakes may den in large numbers, moving up to 7 miles out from the dens during the summer (C. Peterson, pers. comm.); den sites are most common in south-facing talus slopes. In Wyoming, it is found up to elevations of over 8,500 feet (Baxter and Stone 1985). Rattlesnakes prey on a variety of animals including mice, ground squirrels, rabbits, amphibians, and other snakes. In Colorado, females give birth to 4-21 young during the summer (Hammerson 1982a).

Surveying: A walk-through survey on a warm sunny day is probably the best method for determining presence/absence; it is easiest to find near den sites in spring and fall. Funnel traps and night driving are both effective techniques. Mark-recapture methods can be used to determine more precise numbers.

Status: The Western Rattlesnake is most likely be encountered at lower elevations in open habitats. The habit of denning at traditional sites in large numbers makes rattlesnakes vulnerable to commercial collecting or simply killing by fearful people. Observations of Western Rattlesnakes should be reported to document the presence of this species; of particular interest would be documentation of any denning sites.

Montana Natural Heritage Program Rank: G5 S4.

Common Garter Snake (*Thamnophis sirtalis*) **ARADB36130**

Description: The Common Garter Snake consists of two color phases in western Montana, both ranging from 18-52" in length. Both phases have three yellow longitudinal stripes: one located dorsally and one on each side on the 2nd and 3rd scale rows above the belly scales. Between the yellow stripes is a black (or dark green) background, broken with red spots in one color phase but lacking red in the other. Ventral coloration varies from yellow to bluish, and some individuals of the red-sided color phase have small black spots on the edge of the ventral scales. The dorsal scales are keeled, and normally there are 7 upper labial scales.

Young: The coloration of young snakes is similar to that of the adults; young are live-born.

Similar species: The Western Terrestrial Garter Snake has black spots overlapping the dorsal yellow stripe; the background color between stripes tends to be paler dusky green, gray or brown. The Plains Garter Snake has the side yellow stripe on the 3rd and 4th scale rows above the belly scales and the dorsal stripe is often orange or red.

Habitat and Habits: Garter snakes are found in all forest habitats but are more common at lower elevations around marsh-bog-pond situations, where they prey on young fish, frogs, toads, mice and invertebrates. They are sometimes confused with water snakes because of their frequent aquatic exploits, but there are no true water snakes in Montana. Typical of most garter snakes, they emit a noxious secretion when handled and can be aggressive when disturbed. Historically they have been found at low elevations in the intermountain valleys as well as elevations up to 5,600 feet. Garter snakes eat a variety of vertebrates and invertebrates, with the Common Garter Snake concentrating more on amphibians than the Western Terrestrial Garter Snake. *Young:* The Common Garter Snake is a livebearer, giving birth to 12-18 young during the summer in Colorado (Hammerson 1982a).

Surveying: Timed-sight surveys may be conducted around wetlands and riparian feeding areas or at denning areas where higher concentrations of garter snakes occur; clear mornings are the best survey times. Much distributional information may come from recording incidental sightings. More intensive research and survey projects may use funnel traps in combination with drift fences, or mark-recapture or radiotelemetry techniques.

Status: Given the small number of records from throughout the area, all records should be documented until the distribution is better understood; of particular interest would be documentation of denning sites.

Montana Natural Heritage Program Rank: G5 S4.

Western Terrestrial Garter Snake (*Thamnophis elegans*) **ARADB36050**

Description: Adult Western Terrestrial (or Wandering) Garter Snakes are smaller than the Common Garter Snake, their length varying from 18-43". Three yellow longitudinal stripes are present (one dorsal, two lateral on the 2nd and 3rd scale rows), but the dorsal stripe is much narrower than that of the Common Garter Snake. A distinctive feature of the Western Terrestrial Garter Snake is a series of alternating black spots which run the length of the body between, and somewhat on, the yellow stripes. The background color between the stripes is a dusky gray, green or brown. compared to the black or occasionally dark green found in the Common Garter Snake. The ventral surface has a series of dark black/brown blotches that may cover most of the surface. All black, presumably melanistic, individuals are occasionally found near Townsend, Montana. The dorsal scales are keeled and there are normally 8 upper labial scales.

Young: The coloration of young snakes is similar to that of the adults; young are live-born. Females give birth to 4-19 young during the summer (Stebbins 1985).

Similar species: See Common Garter Snake.

Habitat and Habits: The habitat and habits of the Western Terrestrial Garter Snake are similar to the Common Garter Snake, i.e., they are found in most habitats but are particularly common around wetlands.

Surveying: Timed sight surveys may be conducted around wetlands and riparian feeding areas or at denning areas where higher concentrations of garter snakes occur; clear mornings are the best survey times. Much distributional information may come from recording incidental sightings. More intensive research and survey projects may use funnel traps in combination with drift fences, or mark-recapture or radiotelemetry techniques.

Status: Given the small number of recent records from throughout the area, all records should be documented until the distribution is better understood; of particular interest would be documentation of denning sites.

Montana Natural Heritage Program Rank: G5 S5.

RECOMMENDATIONS

1) Incidental sightings of amphibians and reptiles in southwestern Montana should be recorded and forwarded to the Natural Heritage Program. Of particular interest are all observations and locations of breeding amphibians (tadpoles and/or eggs) and all reptiles. Use Reichel and Flath (1995) as an identification aid. Vouchers of amphibian tadpoles can be sent to the Natural Heritage program for identification. The Natural Heritage website has an online form for submitting herp observation data at http://nris.mt.gov/mtnhp/index.html.

2) Due to the time constraints and the large area covered in this survey, it should not be regarded as a definitive index of all the amphibians and reptiles or their presence on the surveyed area. The secretive habits of many amphibians and reptiles, and our lack of knowledge regarding their reproductive behavior make it difficult to assess their overall status. We recommend that additional surveys be conducted.

3) When a more complete picture of breeding locations for amphibians are identified in the area, long-term monitoring of typical marsh-pond habitats should be set up at several sites in order to evaluate relative numbers and breeding success of the more common species: Tiger Salamander, Western Chorus Frog, Woodhouse's Toad, Northern Leopard Frog, Plains Garter Snake, and Common Garter Snake. Particular attention needs to be given to any toad and Northern Leopard Frog breeding sites found. Life history and ecology of the amphibians in Montana is poorly known for most species. Long-term monitoring will give us information on timing of breeding and habitat requirements needed for successful reproduction.

4) Recent studies have examined amphibian use of the terrestrial area surrounding wetland areas. The aim of those studies is to establish baseline data for determining appropriate buffer distances from wetland edges for protection of amphibians. Using data from six salamander species, Semlitsch (1998) found the mean distance that adult salamanders were found away from aquatic habitats was 125 meters. Although studies have not been conducted for species occurring in Montana, it is becoming increasingly apparent that protecting terrestrial buffers are around wetlands are important in conserving biological diversity (Semlitsch 1998).

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APPENDIX 1.

Amphibians and reptile

survey sites in the

in the Dillon and Headwaters Districts

and the Red Rock Lakes.

1996 - 1998

Appendix 1. Survey sites within the Dillon and Headwaters districts with location and species information 1996 – 1998.

SURVEY	COUNTY	TR	S	Q	SPEC	MO	DA	YR	START	MIN	ELEV	SQ m	Y/N	SITE	COMMENTS
MT960059	Beaverhead	001N012W	10	SE	RALU, THEL	7	25	1996	1445	65	5760	50000	Y	Big Hole R - Dickey Br Access Area	
MT960048	Beaverhead	004S016W	17	SE	RALU	7	9	1996	1515	45	6600	45000	Y	Rock Ck - Twin Lake Rd	
MT960054	Beaverhead	005S016W	15	W2	RALU	7	19	1996	1250	40	6710	90000	Y	Big Swamp off Big Swamp Ck	
MT960049	Beaverhead	005S017W	10	S2	BUBO	7	9	1996	1710	50	7190	3000	Y	Twin Lakes	
MT960057	Beaverhead	006S010W	30	W2	THEL	7	25	1996	920	40	6200	32000	Y	Rattlesnake Ck past Argenta	
MT960053	Beaverhead	006S016W	1	W2	RALU	7	19	1996	1730	80	6960	14400	Y	Miner Lakes Rd - temp ponds in W2 of Sec 1	
MT960056	Beaverhead	009S010W	31		CRVI	7	21	1996	1510	140	5740	960000	Y	BLM lands N of Clark Canyon	Section 31/32
MT961345	Beaverhead	009S010W	2		PSTR	5	26	1996					Y	Beaverhead River floodplain, flooded hayfield	
MT960051	Beaverhead	010S015W	16	NE	RALU, THEL	7	10	1996	1430	60	6990	2000	Y	Trail Ck below Lemhi Pass	
MT960052	Beaverhead	010S015W	22	SW	RALU	7	10	1996	1620	40	6960	300	Y	Frying Pan Ck - springs/seep	
MT961349	Beaverhead	011S010W	35		PSTR	5	26	1996					Y	Red Rock River floodplain	
MT961339	Beaverhead	013S001E	32		PSTR	5	25	1996					Y	S. end of Elk Lake, ca. 1 mi N of Red Rocks Lake NWR	
MT961336	Beaverhead	014S001E	18		PSTR, RALU	5	24	1996					Y	Red Rock Lakes NWR, Red Rock Cr. at Elk Lake Rd.	
MT961338	Beaverhead	014S002W	16		RALU, PSTR	5	25	1996					Y	Red Rocks Lake NWR, marshy area along Red Rocks Pass Rd.	
MT961340	Beaverhead	014S002W	21		PSTR	5	25	1996					Y	Red Rock Lakes NWR, ponds along rd to airstrip, by Shambow Cr.	
MT961341	Beaverhead	014S002W	5		PSTR	5	25	1996					Y	Red Rocks Lake NWR, Lower Red Rock Lake	
MT961347	Beaverhead	014S005W	14		PSTR	5	26	1996					Y	Mud Lake outlet along Red Rock Pass Rd.	
MT961348	Beaverhead	014S005W	30		PSTR	5	26	1996					Y	Lima Reservoir drainage area N of Red Rock Pass Rd.	
MT960045	Beaverhead	014S012W	23		RALU, THEL	7	7	1996	1545	135	7610	180000	Y	Morrison Lake & outlet ponds	R. Pretiosa found in both Morrison Lake and an outlet pond. T. Elegans found only in outlet pond.
MT960047	Beaverhead	003S017W	23	SW	RALU, THEL	7	9	1996	1130	45	6190	25000	Y	Swamp Ck	
MT980119	Beaverhead	009S015W	23	NW	RALU, THEL	7	13	1998	1605	85	7085	27000	Y	Bloody Dick Creek on Cty Rd 181, 12 mi W of Cty Rd. 324	F1038;S1038

*Species abbreviations: Ambystoma macrodactylum AMMA; Ambystoma tigrinum AMTI; Ascaphus truei ASTR; Bufo boreas BUBO; Bufo woodhousii BUWO; Charina bottae CHBO; Chrysemys picta CHPI; Coluber constrictor COCO; Crotalus viridis CRVI; Lampropeltis triangulum LATR; Phrynosoma hernandesi PHHE; Pituophis catenifer PICA; Pseudacris triseriata PSTR; Rana catesbeiana RACA; Rana luteiventris RALU (=Rana pretiosa RAPR); Rana pipiens RAPI; Sceloporus graciosus SCGR; Spea bombifrons SPBO; Thamnophis elegans THEL; Thamnophis sirtalis THSI; Trionyx spiniferus TRSP.

Appendix 1. Survey sites within the Dillon and Headwaters districts with location and species information 1996 – 1998.

SURVEY	COUNTY	TR	S	Q	SPEC	MO	DA	YR	START	MIN	ELEV	SQ m	Y/N	SITE	COMMENTS
MT980121	Beaverhead	010S013W	33	SE	RALU	7	14	1998	1345	45	6921	7700	Y	Shenon Creek headwaters, 4 mi E of Cty Rd 324	F1040;S1040
MT980128	Beaverhead	011S008W	15	NW	RALU	7	16	1998	1320	55	6731	12025	Y	Long Creek on Sage Creek Rd, 18 mi NE of Dell	F1047;S1047
MT980120	Beaverhead	011S014W	35	SW	RALU	7	14	1998	1110	65	7446	21600	Y	N Fk of Divide Creek, 1 mi below Bannock Pass	F1039;S1039
MT980090	Beaverhead	012S006W	15	NE	THEL	6	13	1998	1515	75	6980	43000	Y	W Fork of Blacktail Deer Creek, 11 mi N of Lima Reservoir	F1000;S1000
MT980124	Beaverhead	012S012W	13	NW	RALU	7	15	1998	1330	30	6626	525	Y	Medicine Lodge Creek tributary along Cty Rd 257 near Medicine Lodge Peak	F1043;S1043
MT980140	Beaverhead	013S003W	33	SW	PSTR	7	21	1998	1510	50	6783	42000	Y	Red Rock River by Brundage Bridge, off N side Rd (Cty Rd 268)	F1059;S1059
MT980125	Beaverhead	013S012W	2	NW	RALU, THEL	7	15	1998	1430	45	7052	7500	Y	Medicine Lodge Creek near Hildreth on Cty Rd 257, 18 mi S of Cty Rd 324	F1044;S1044
MT980138	Beaverhead	014S001E	17	NW	RALU	7	21	1998	1000	70	6714	26400	Y	Red Rock Creek & backwater ponds by Red Rock Pass Rd (Cty Rd 201)	F1057;S1057
MT980133	Beaverhead	014S002W	21	NW	PSTR, RALU	7	19	1998	1205	55	6986	10500	Y	Duff Creek beaver pond, 1 mi S of Red Rock Pass Rd (Cty Rd 201)	F1052;S1052
MT980134	Beaverhead	014S002W	21	SE	AMTI, BUBO, PSTR, RALU	7	19	1998	1330	90	7118	750	Y	Pond on unnamed creek E of Duff Creek, 1.5 mi S of Cty Rd 201	F1053;S1053
MT980135	Beaverhead	014S002W	27	SE	RALU	7	19	1998	1700	45	7478	600	Y	Pond off W Fk. of Shambow Crk, 2.5 mi SW of Lakeview	F1054;S1054
MT980142	Beaverhead	014S002W	33	NE	RALU	7	22	1998	1145	75	8216	10800	Y	Upper Shambow pond off E Fk of Shambow Ck, 3 mi SW of Lakeview	F1061;S1061
MT980136	Beaverhead	014S003W	36	SW	BUBO, RALU	7	20	1998	1500	90	8134	57600	Y	Brenerman Lake (Reservoir), 3.5 mi S of Red Rock Pass Rd (Cty Rd 201)	F1055;S1055;Breeding ponds 0.5 mi below?
MT980137	Beaverhead	014S003W	34	NE	AMTI, RALU, THEL	7	20	1998	1300	45	7249	1500	Y	Paul Allen Ranches, 1.5 mi S of Red Rock Pass Rd (County Rd 201)	F1056;S1056
MT980144	Beaverhead	014S005W	30	SW	PSTR, RALU	7	22	1998	1710	50	6855	3200	Y	Sand Creek blown out reservoir, 1 mi S on BLM Rd 1805	F1063;S1063

*Species abbreviations: Ambystoma macrodactylum AMMA; Ambystoma tigrinum AMTI; Ascaphus truei ASTR; Bufo boreas BUBO; Bufo woodhousii BUWO; Charina bottae CHBO; Chrysemys picta CHPI; Coluber constrictor COCO; Crotalus viridis CRVI; Lampropeltis triangulum LATR; Phrynosoma hernandesi PHHE; Pituophis catenifer PICA; Pseudacris triseriata PSTR; Rana catesbeiana RACA; Rana luteiventris RALU (=Rana pretiosa RAPR); Rana pipiens RAPI; Sceloporus graciosus SCGR; Spea bombifrons SPBO; Thamnophis elegans THEL; Thamnophis sirtalis THSI; Trionyx spiniferus TRSP.

Appendix 1. Survey sites within the Dillon and Headwaters districts with location and species information 1996 – 1998.

SURVEY	COUNTY	TR	S	Q	SPEC	MO	DA	YR	START	MIN	ELEV	SQ m	Y/N	SITE	COMMENTS
MT980126	Beaverhead	014S011W	25	SE	THEL	7	15	1998	1700	60	7036	6000	Y	Cabin Creek on Cty Rd 257, 19 mi SW of Dell	F1045;S1045
MT980143	Beaverhead	015S004W	6	NW	RALU, THEL	7	22	1998	1530	70	7134	4600	Y	W Fk of Price Creek beaver pond, 3 mi S on BLM Rd 1805	F1062;S1062
MT960063	DeerLodge	001N013W	18		BUBO, RALU	7	19	1996	1030	60	5580	60000	Y	Big Hole R. ca. 16 mi N of Wisdom	
MT960018	DeerLodge	001N014W	24	N2SE	BUBO, RALU	7	10	1996	1115	60	5970	25000	Y	Pond off middle Big Hole River	Blasted potholes (~1993) in natural wetlands.
MT960019	DeerLodge	001N014W	26	NENW	RALU	7	10	1996	1307	20	5890	2100	Y	Pond on middle Big Hole River	
MT960004	Jefferson	005N004W	8	NE	BUBO, RALU	8		1996			4950		Y	"Chinese Diggins" S of Boulder on Little Boulder R	
MT970111	Lewis&Clark	014N006W	7		RALU	4	22	1997	1230	70	5085	1500	Y	Willow Creek beaver ponds	
MT960062	Madison	003S009W	26	W2	CRVI, THEL	7	23	1996	1030	90		1440000	Y	Big Hole R & backwater areas near Browne's Br	
MT960003	Madison	005S008W	3	NW	CHPI	7	23	1996	1515	105	4760	65000	Y	Bighole River, Notch Bottom	
MT960060	Madison	007S002W	8	NW4	RALU, THEL	7	12	1996	1100	150	7250	1	Y	Axolotl Lake (northern most) & assoc. ponds	
MT960061	Madison	007S004W	7	SE4	THEL	7	12	1996	1510	140	5708	100000	Y	Warm Spring ponds ca. 400 m above Ruby R Reservoir	The fish & dragonflies at these ponds are very different - have rust/red coloration to them. Fish look like guppies (Pocoelidae family?)
MT970116	Madison	005S002E	24	SWSE	BUBO, RALU	7	21	1997	1030	60	7920	38000	Y	Spanish Peaks section 24 lake.	
MT960017	SilverBow	001N012W	10	NESE	RALU, THEL	7	10	1996	1435	20	5700	3500	Y	Dicky Bridge Pond	
MT960006	SilverBow	001N012W	3	SESW	RALU, THEL	7	10	1996	1405	20	5740	350	Y	East Bank Campgrounds, Bighole R	
MT960058	Beaverhead	001S010W	13	NE4		7	25	1996	1235	75	5500	240000	N	Divide Bridge Campground area	Sawmill Gulch
MT960478	Beaverhead	002N015W	7	SE		9	1	1996	1300	60	8410	15000	N	Sawed Cabin Lake	
MT961344	Beaverhead	007S009W	35			5	26	1996					N	Poindexter Slough on Beaverhead River	No herps observed.
MT960050	Beaverhead	008S011W	5			7	10	1996	1110	80	5775	400000	N	Bannack St Park & vicinity	Seasonal worker, S. Larsen, said they occ. have rattlesnakes. Cindy Staszak - Pk manager 834-3413 can confirm.
MT960046	Beaverhead	013S010W	36	NW		7	7	1996	1130	60	6345	12000	N	Big Sheep Creek	

*Species abbreviations: Ambystoma macrodactylum AMMA; Ambystoma tigrinum AMTI; Ascaphus truei ASTR; Bufo boreas BUBO; Bufo woodhousii BUWO; Charina bottae CHBO; Chrysemys picta CHPI; Coluber constrictor COCO; Crotalus viridis CRVI; Lampropeltis triangulum LATR; Phrynosoma hernandesi PHHE; Pituophis catenifer PICA; Pseudacris triseriata PSTR; Rana catesbeiana RACA; Rana luteiventris RALU (=Rana pretiosa RAPR); Rana pipiens RAPI; Sceloporus graciosus SCGR; Spea bombifrons SPBO; Thamnophis elegans THEL; Thamnophis sirtalis THSI; Trionyx spiniferus TRSP.

Appendix 1. Survey sites within the Dillon and Headwaters districts with location and species information 1996 – 1998.

SURVEY	COUNTY	TR	S	Q	SPEC	MO	DA	YR	START	MIN	ELEV	SQ m	Y/N	SITE	COMMENTS
MT960055	Beaverhead	013S010W	36	NW4		7	21	1996	1030	90	6560	1280000	N	Rattlesnake Ck past Argenta	Searched along bank (some water in lower stretches) and on hillsides. Rattlesnake country but none found.
MT961337	Beaverhead	014S001W	21			5	24	1996					N	Red Rocks Lake NWR, beaver ponds on S shore of Upper Red Rock Lake	No herps found.
MT961343	Beaverhead	014S004W	19			5	26	1996					N	Breached irrigation dam area along Red Rock Pass Rd.	No species found.
MT970011	Madison	002S003W	22			5	29	1997	1145	60	6800	1500	N	Cataract Creek above Cataract Reservoir	also checked 50 m of Res. shoreline, no emergent or aquatic veg. present - very sterile, no herps seen.
MT980145	Beaverhead	007S006W	12	NE		7	24	1998	1100	90	7806	6300	N	Cottonwood Creek headwaters, 1 mi N (above) Cottonwood Creek Rd	F1064;S1064
MT980146	Beaverhead	009S005W	4	NE		7	24	1998	1415	75	5838	4920	N	Sweetwater Creek, 9 mi S of Ruby Reservoir on Cottonwood Creek Rd	F1065;S1065
MT980130	Beaverhead	009S014W	28	NW		7	13	1998	1340	70	6986	4750	N	Station Creek by Horse Prairie Guard Station, 2 mi NW of Cty Rd 181	F1049;S1049
MT980118	Beaverhead	010S013W	4	NE		7	13	1998	1115	75	6101	58800	N	Rape Creek Reservoir off Cty Rd 324, 17 mi W of Clark Canyon Reservoir	F1037;S1037
MT980122	Beaverhead	011S012W	33	SE		7	15	1998	1045	45	6757	1500	N	Lake Canyon Creek & Spring, 3 mi W of Cty Rd 257, 11 mi S of Cty Rd 324	F1041;S1041
MT980123	Beaverhead	011S012W	33	SW		7	15	1998	1210	50	6724	7200	N	Swartz Creek, 4 mi W of Cty Rd 257, 11 mi S of Cty Rd 324	F1042;S1042
MT980091	Beaverhead	012S006W	35	NE		6	13	1998	1645	45	7200	7150	N	W Fork of Blacktail Deer Creek, 8 mi N of Lima Reservoir	F1001;S1001
MT980127	Beaverhead	012S008W	2	NW		7	16	1998	1130	60	6527	17500	N	Sage Creek off Sage Creek Rd, 14 mi NE of Dell	F1046;S1046
MT980129	Beaverhead	012S008W	12	SE		7	16	1998	1600	85	6576	5400	N	Little Sage Creek, 2 mi E of Sage Creek Rd, 14 mi NE of Dell	F1048;S1048
MT980139	Beaverhead	013S001W	35	N2		7	21	1998	1145	45	6658	1440000	N	Sand dunes on NW side of Refuge along N side Rd (Cty Rd 268)	F1058;S1058

*Species abbreviations: Ambystoma macrodactylum AMMA; Ambystoma tigrinum AMTI; Ascaphus truei ASTR; Bufo boreas BUBO; Bufo woodhousii BUWO; Charina bottae CHBO; Chrysemys picta CHPI; Coluber constrictor COCO; Crotalus viridis CRVI; Lampropeltis triangulum LATR; Phrynosoma hernandesi PHHE; Pituophis catenifer PICA; Pseudacris triseriata PSTR; Rana catesbeiana RACA; Rana luteiventris RALU (=Rana pretiosa RAPR); Rana pipiens RAPI; Sceloporus graciosus SCGR; Spea bombifrons SPBO; Thamnophis elegans THEL; Thamnophis sirtalis THSI; Trionyx spiniferus TRSP.

Appendix 1. Survey sites within the Dillon and Headwaters districts with location and species information 1996 – 1998.

SURVEY	COUNTY	TR	S	Q	SPEC	MO	DA	YR	START	MIN	ELEV	SQ m	Y/N	SITE	COMMENTS
MT980141	Beaverhead	013S002W	23	NW		7	21	1998	1700	90	6691	225000	N	Sand dunes on Sec 23, 1 mi N of North side Rd (Cty Rd 268)	F1060;S1060
MT980132	Beaverhead	014S005W	23	NW		7	18	1998	1450	70	6616	17100	N	Mud Lake, 300 m N of Red Rock Pass Rd (Cty Rd 201)	F1051;S1051
MT980131	Beaverhead	014S006W	15	NE		7	18	1998	1115	105	6593	4800	N	Lima Reservoir N of Lima Cove, 4 mi N of Red Rock Pass Rd (Cty Rd 201)	F1050;S1050
MT960023	Broadwater	004N003E	6	NESE		7	18	1996	1215	60	3850	10500	N	Big Springs S of Toston	
MT960024	Broadwater	004N003E	6	SE		7	18	1996	1100	45	3950	3600	N	Overflow pond off irrigation canal N of Toston Dam	Little aquatic invertebrate life; apparently recently flooded via overflow from canal.
MT960025	Broadwater	004N003E	6	SE		7	18	1996	1020	25	3930	3500	N	Ponds in gravel pit N of Toston Dam	
MT960022	Broadwater	010N002E	35	NWSW		7	12	1996	1330	25	4580	12500	N	Beaver ponds - Lower Confederate Gulch	
MT970113	Gallatin	002S004E	35	NWNW		7	21	1997	1630	60	4810	4875	N	Axtell Bridge on Gallatin River ca. 2 mi S of Bozeman Hot Springs	
MT970112	Gallatin	004S004E	5	NENE		7	21	1997	1800	45	5180	3600	N	Gallatin River 5 mi S of Gallatin Gateway	
MT960021	Lewis&Clark	010N002E	19	SE		7	12	1996	1245	20	4260	800	N	Lower White Gulch	
MT960020	Lewis&Clark	011N002W	13	SW		7	12	1996	1106	30	3650	20000	N	Mouth of Trout Creek	
MT970009	Madison					5	30	1997	1100	100		4000	N	Ruby Res., East Side	
MT980117	Madison	003S007W	16	S2		7	3	1998	1230	90	5182	160000	N	Rochester Creek, 5 mi W of Twin Bridges	F1036;S0136

*Species abbreviations: Ambystoma macrodactylum AMMA; Ambystoma tigrinum AMTI; Ascaphus truei ASTR; Bufo boreas BUBO; Bufo woodhousii BUWO; Charina bottae CHBO; Chrysemys picta CHPI; Coluber constrictor COCO; Crotalus viridis CRVI; Lampropeltis triangulum LATR; Phrynosoma hernandesi PHHE; Pituophis catenifer PICA; Pseudacris triseriata PSTR; Rana catesbeiana RACA; Rana luteiventris RALU (=Rana pretiosa RAPR); Rana pipiens RAPI; Sceloporus graciosus SCGR; Spea bombifrons SPBO; Thamnophis elegans THEL; Thamnophis sirtalis THSI; Trionyx spiniferus TRSP.

APPENDIX 2.

Amphibians and reptile

survey sites in the

in the Dillon and Headwaters Districts

and the Red Rock Lakes.

1994 - 1995

Appendix 2. Survey sites within the Dillon and Headwaters districts with location and species information 1994 – 1995.

SURVEY	COUNTY	TR	S	Q	SPEC	MO	DA	YEAR	START	MIN	ELEV	SQ m	Y/N	SITE	COMMENTS
MT950515	Beaverhead	004S009W	30		RALU	7	20	1995					Y	Confluence of Birch Creek and Big Hole River	
MT950520	Beaverhead	005S010W	9		RALU	7	21	1995					Y	Pond by cabin; 0.3 mi N of confluence of Thief and Birch Creeks	
MT950528	Beaverhead	005S010W	7		RALU	7	21	1995					Y	30 m N of Thief Creek, 0.9 mi SW of Middle Mtn	
MT950526	Beaverhead	005S011W	1		RALU	7	21	1995					Y	Dinner Station Campground, marsh on Birch Cr. (SE 0.75 mile from Deerhead L.)	
MT950534	Beaverhead	005S011W	1		RALU	7	21	1995					Y	Dinner Station Stream/marsh	
MT950556	Beaverhead	005S011W	3		AMMA, BUBO, RALU	7	29	1995					Y	Small Creek between Lily Lake and Birch Cr.	
MT950559	Beaverhead	005S011W	3		BUBO, RALU	7	29	1995					Y	Lily Lake	
MT950121	Broadwater	005N005E	6	N2	RALU	5	17	1995	1425	10	5760		Y	Big Belt Mtns; upper pond on Dry Creek	UTM 5118800N 488600E
MT950141	Broadwater	006N001W	17	N	RALU	5	29	1995	1645	75	5430		Y	South Fork Crow Creek	UTM 5124900N 442000E
MT950108	Broadwater	006N002E	21	NW	CHPI	5	9	1995	1532	13	3850		Y	Deepdale fishing access	UTM 5123500N 462300E
MT950117	Broadwater	006N004E	34	NE	RAPI	5	17	1995	1500	80	5380		Y	Big Belt Mtns, upper Dry Creek beaver complex.	UTM 5120000N 484000E
MT950366	Broadwater	010N002E	9	NWNE	RALU, THEL	7	12	1995	1538	42	5720		Y	Lake off of Springs Gulch, Big Belt Mtns	
MT950367	Broadwater	011N001E	20	NESE	RALU	7	12	1995	1025	21	4600		Y	Middle Magpie Creek Beaver Pond, Big Belt Mtns	
MT950369	Broadwater	011N002E	9	SWNE	RALU	7	12	1995	1230	25	5440		Y	Avalanche Creek at Narytime Gulch, Big Belt Mtns	
MT950684	Jefferson	007N006W	20	SW	AMMA, RALU	9	6	1995	1100	30	7100		Y	Cliff Lake, Red Rock Drainage	
MT950113	Jefferson	008N002W	8	NW	AMMA, RALU	5	15	1995	1050	60	5080		Y	Mill Creek headwaters	UTM 5146500N 432400E
MT950114	Jefferson	008N002W	20	NE	AMMA, RALU	5	15	1995	1310	30	5760		Y	Upper Willard Creek	UTM 5142800N 432600E
MT950127	Jefferson	008N004W	5	SW	AMMA, RALU	5	20	1995	1105	10	5640		Y	Old beaver pond in upper Corral Gulch.	UTM 5146400N 412800E
MT950130	Jefferson	008N005W	13	NWSE	RALU	5	20	1995	1220	10	6540		Y	Smaller pond just below Park Lake	UTM 5143700N 410100E
MT950132	Jefferson	008N005W	13	NWSE	AMMA,	5	20	1995	1250	50	6540		Y	Large pond just below Park Lake	UTM 5143700N 410000E.

*Species abbreviations: Ambystoma macrodactylum AMMA; Ambystoma tigrinum AMTI; Ascaphus truei ASTR; Bufo boreas BUBO; Bufo woodhousii BUWO; Charina bottae CHBO; Chrysemys picta CHPI; Coluber constrictor COCO; Crotalus viridis CRVI; Lampropeltis triangulum LATR; Phrynosoma hernandesi PHHE; Pituophis catenifer PICA; Pseudacris triseriata PSTR; Rana catesbeiana RACA; Rana luteiventris RALU (=Rana pretiosa RAPR); Rana pipiens RAPI; Sceloporus graciosus SCGR; Spea bombifrons SPBO; Thamnophis elegans THEL; Thamnophis sirtalis THSI; Trionyx spiniferus TRSP.

Appendix 2. Survey sites within the Dillon and Headwaters districts with location and species information 1994 – 1995.

SURVEY	COUNTY	TR	S	Q	SPEC	MO	DA	YEAR	START	MIN	ELEV	SQ m	Y/N	SITE	COMMENTS
					RALU										
MT940428	Lewis&Clark	015N007W	32	SE	RALU	5	22	1994	1500	60	4757	5500	Y	7-Up Pete proposed gold mine on Hwy 200 ca. 10 mi E of Lincoln	Permanent pond on N side of Hwy.
MT950126	Lewis&Clark	008N005W	2		RALU	5	20	1995	1500	25	6080		Y	Pond 0.5 mi. W of Chessman Reservoir.	UTM 5147100N 407600E
MT950128	Lewis&Clark	009N005W	34	SWSE	AMMA, RALU	5	20	1995	1550	30	5880		Y	Old beaver pond on tributary of Beaver Creek	UTM 5148500N 406700E
MT950359	Lewis&Clark	010N006W	1	SW	AMMA, RALU	7	11	1995	1525	15	5180		Y	Ponds on Austin Creek	
MT950356	Lewis&Clark	011N006W	28	SE	AMMA, RALU	7	11	1995	420	15	5840		Y	Beaver ponds, Meadow Creek	
MT950357	Lewis&Clark	011N006W	16	NE	AMMA, RALU, BUBO	7	11	1995	1700	45	6040		Y	Dog Creek beaver ponds	
MT950653	Lewis&Clark	013N007W	8	NESE	RALU	8	31	1995	1840	10	5840		Y	Poorman Creek, before road leaves creek	
MT950819	Lincoln	014N008W	6	SE	RALU	8	31	1995	1500	15	4747	800	Y	Pond off road - Sucker Creek	
MT950663	SilverBow	001N012W	13	SW	RALU, THEL	9	2	1995	1330	60	5690		Y	5 mile WNW of Wise River	
MT950516	Beaverhead	005S010W	23			7	20	1995					N	Confluence of Canyon Gulch and Birch Creek	No herps found.
MT950517	Beaverhead	005S010W	16			7	20	1995					N	Confluence of Armstrong Gulch and Meyers Gulch	No herps observed.
MT950529	Beaverhead	005S010W	7			7	21	1995					N	3 km E of head of Thief Creek	No herps observed.
MT950549	Beaverhead	005S011W	6			7	27	1995					N	Anchor Lake	No herps observed.
MT950550	Beaverhead	005S011W	6			7	27	1995					N	Chan Lake	No herps observed.
MT950552	Beaverhead	005S011W	8			7	27	1995					N	Tub Lake	No herps observed.
MT950560	Beaverhead	005S011W	4			7	29	1995					N	Boot Lake	No herps observed.
MT950142	Broadwater	006N001W	26			5	29	1995	1500	65	4960		N	Slim Sam Creek beaver complex	No herps seen; UTM 5121600N 445800E
MT950143	Broadwater	006N001W	27	SW		5	29	1995	1430	15	5440		N	Norris Gulch	No herps seen; UTM 5120800N 444700E
MT950122	Broadwater	007N002E	30	NW		5	17	1995	1020	35	3810		N	Indian Road Recreation area.	No herps seen; UTM 5131000N 459200W
MT950145	Broadwater	007N002E	30			5	29	1995	1030	10	3800		N	Pond S of Indian Road Recreation area.	No herps seen; UTM 513100N 459500E
MT950119	Broadwater	007N004W	27	SENW		5	17	1995	1130	10	4780		N	Small pond opposite Deep Creek,	No herps seen; UTM 5130800N

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Appendix 2. Survey sites within the Dillon and Headwaters districts with location and species information 1994 – 1995.

SURVEY	COUNTY	TR	S	Q	SPEC	MO	DA	YEAR	START	MIN	ELEV	SQ m	Y/N	SITE	COMMENTS
														Big Belt Mtns	483700E
MT950120	Broadwater	007N004W	26	SWSE		5	17	1995	1210	20	4880		N	NE of Deep Creek Picnic area, Big Belt Mtns	No herps seen; UTM 5130200N 485400E
MT950118	Broadwater	007N005E	21	NENW		5	17	1995	1300	20	5500		N	Castle Fork Deep Creek, Big Belt Mtns.	No herps seen; UTM 5133700N 491600E
MT950364	Broadwater	011N001E	4	NE		7	12	1995	1115	10	5200		N	Upper Magpie Gulch pond, Big Belt Mtns	No herps found.
MT950144	Jefferson	006N002W	26	NWNE		5	29	1995	1315	10	7000		N	Two Sam Spring	No herps seen; UTM 5122150N 437300E
MT940427	Lewis&Clark	014N007W	7	NW		5	22	1994	1630	60	4740	1800	N	7-Up Pete proposed gold mine on Hwy 200 ca. 10 mi E of Lincoln	Temporary pond.
MT950368	Lewis&Clark	011N001E	30	NWSE		7	12	1995	955	5	4360		N	Lower Magpie Pond, Big Belt Mtns	No herps seen.
MT950651	Lewis&Clark	013N007W	8	SE		8	31	1995	1825	10	5720		N	Poorman Creek	No herps observed
MT950656	Lewis&Clark	014N006W	3	SW		8	31	1995	1020	20	5548		N	Willow Creek	No herps found.

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APPENDIX 3.

Mapped records of

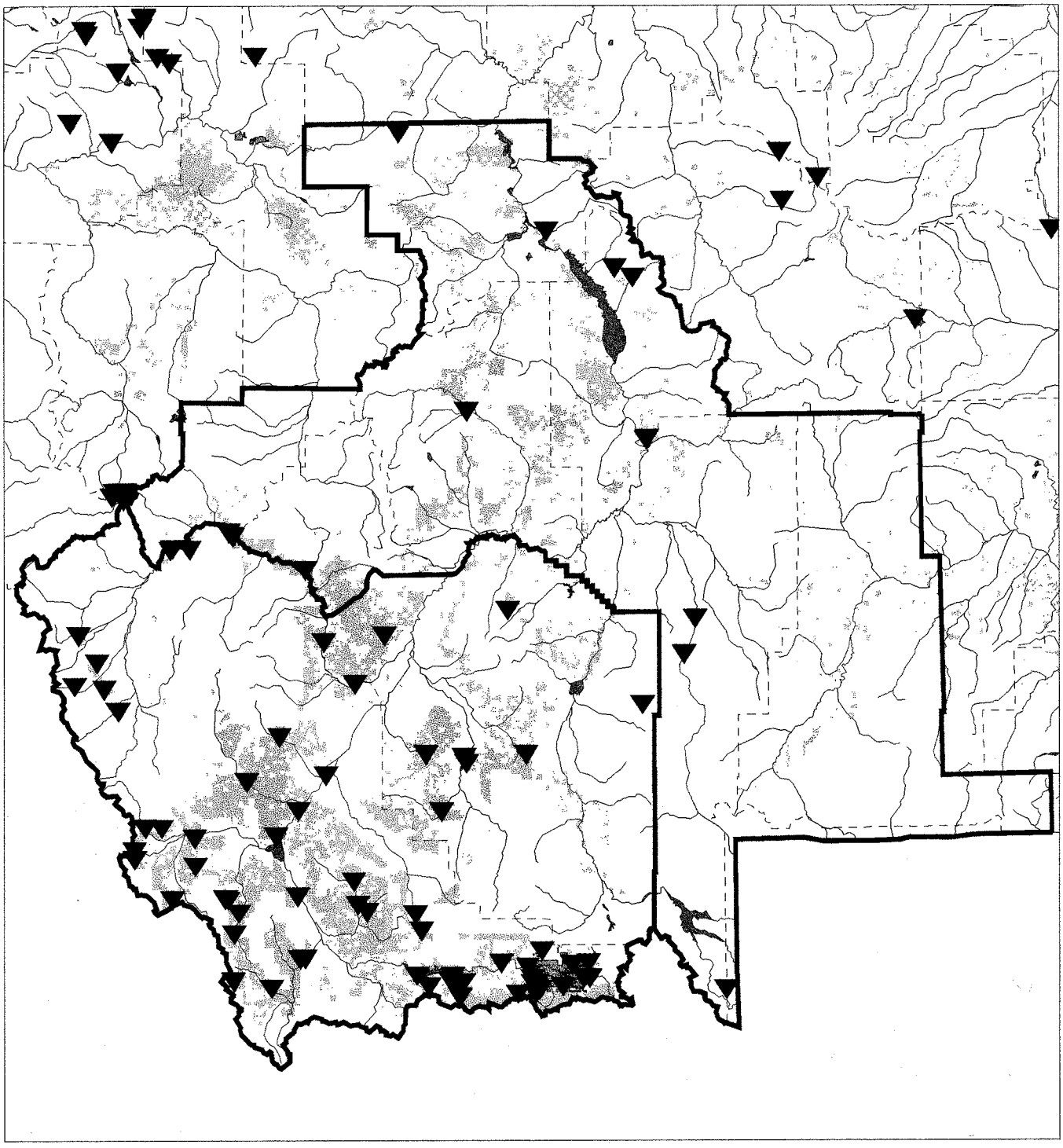
amphibians and reptiles

in the Dillon and Headwaters Districts

and the Red Rock Lakes

Amphibian and Reptile Survey Locations, 1996-1998

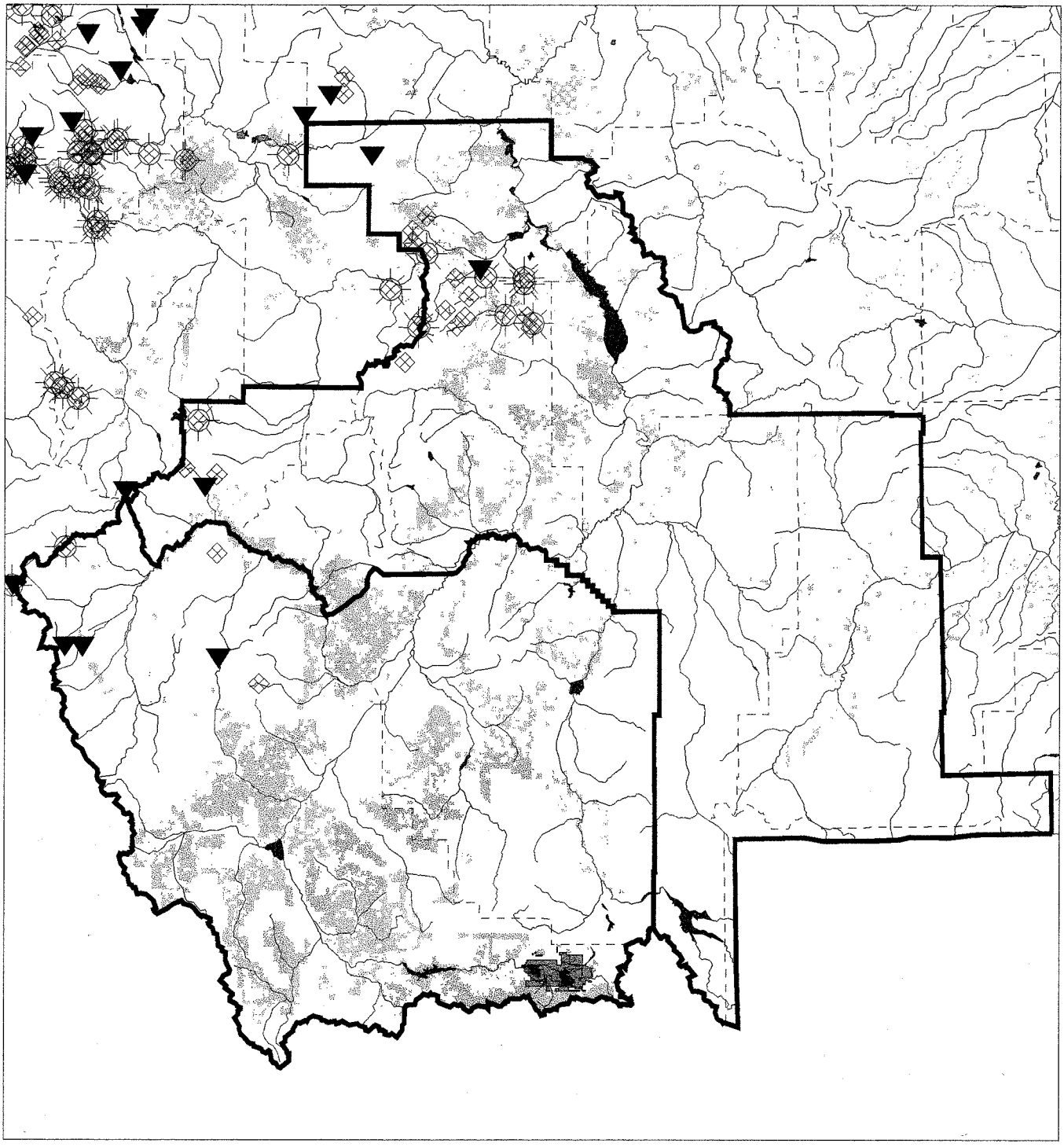
Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



Montana Natural Heritage Program, December 21, 1998

Observations of Ambystoma macrodactylum

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



1996-1998 records

Pre-1996 records

Museum collections

0 10 20 30

Scale in Miles

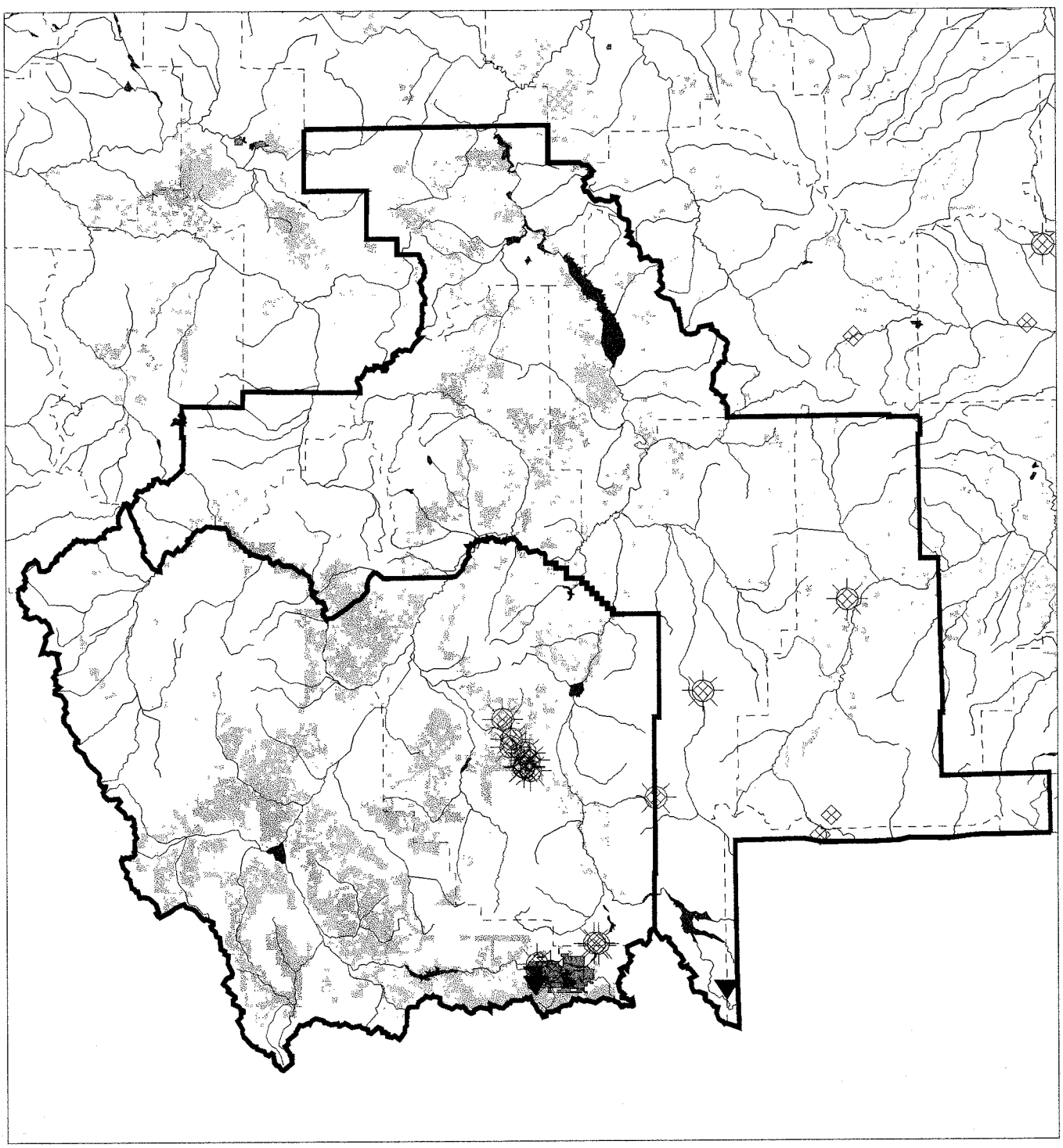
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Ambystoma tigrinum

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

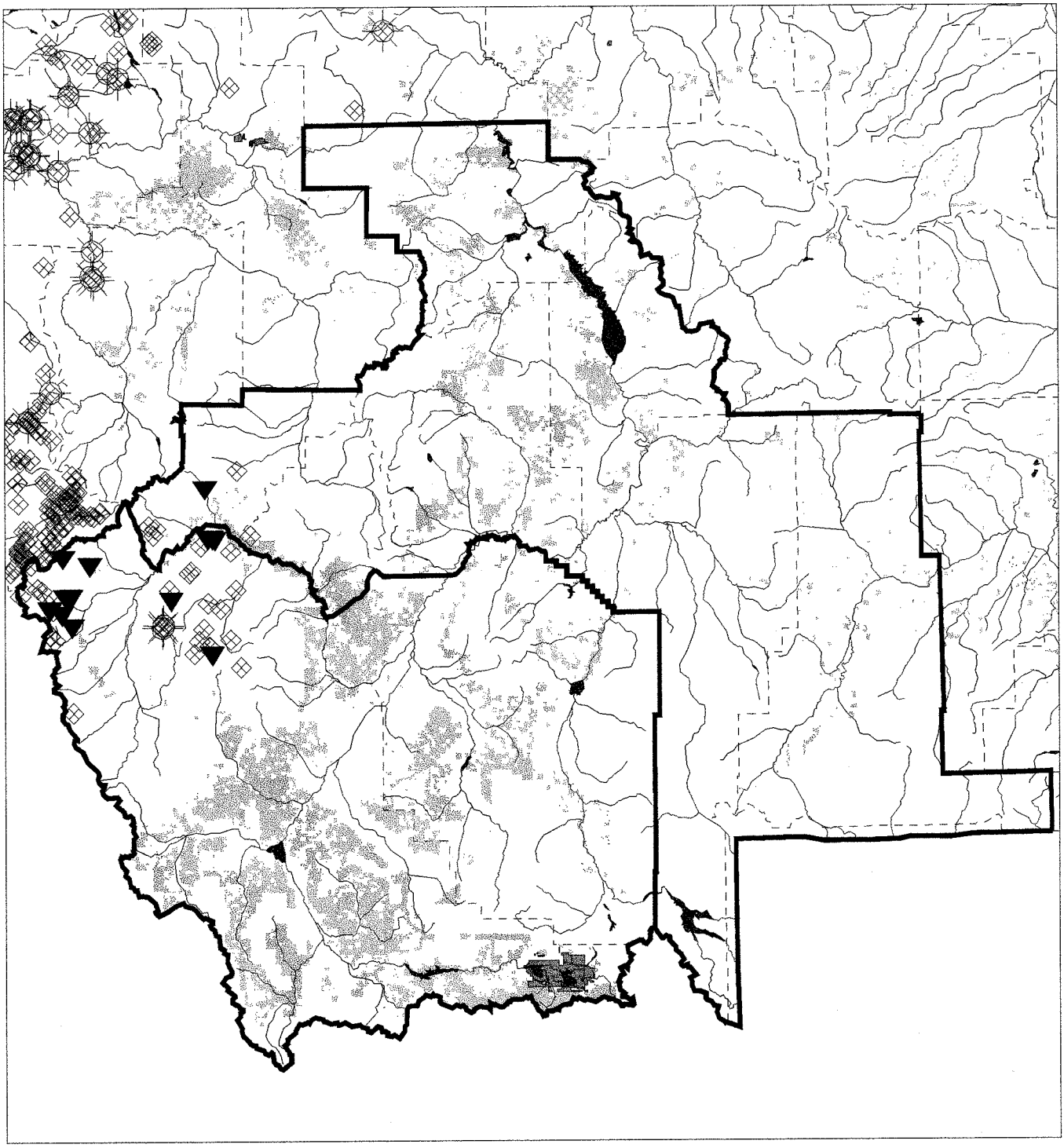
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Ascaphus truei

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



1996-1998 records

Pre-1996 records

Museum collections

0 10 20 30

Scale in Miles

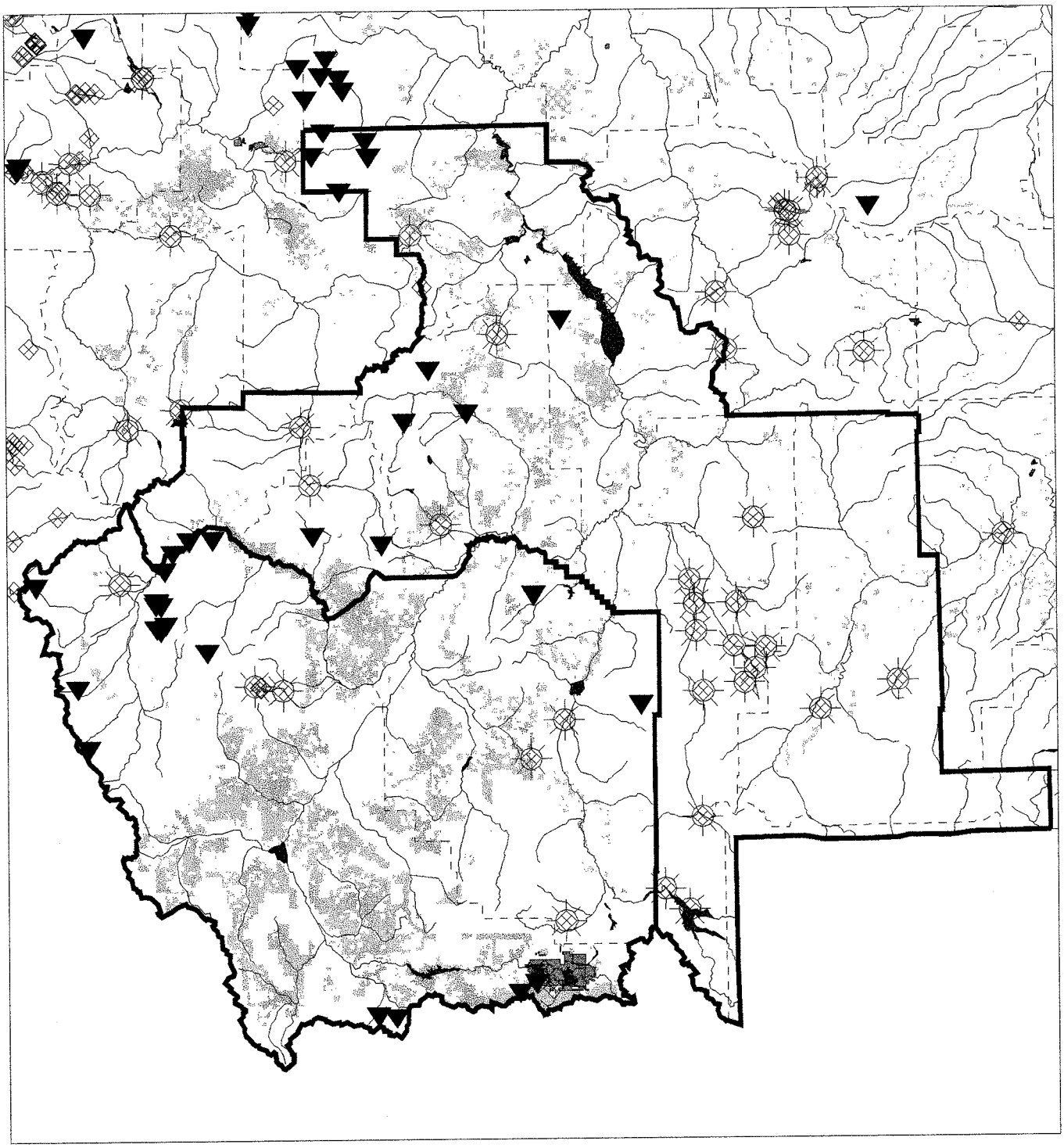
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Bufo boreas

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

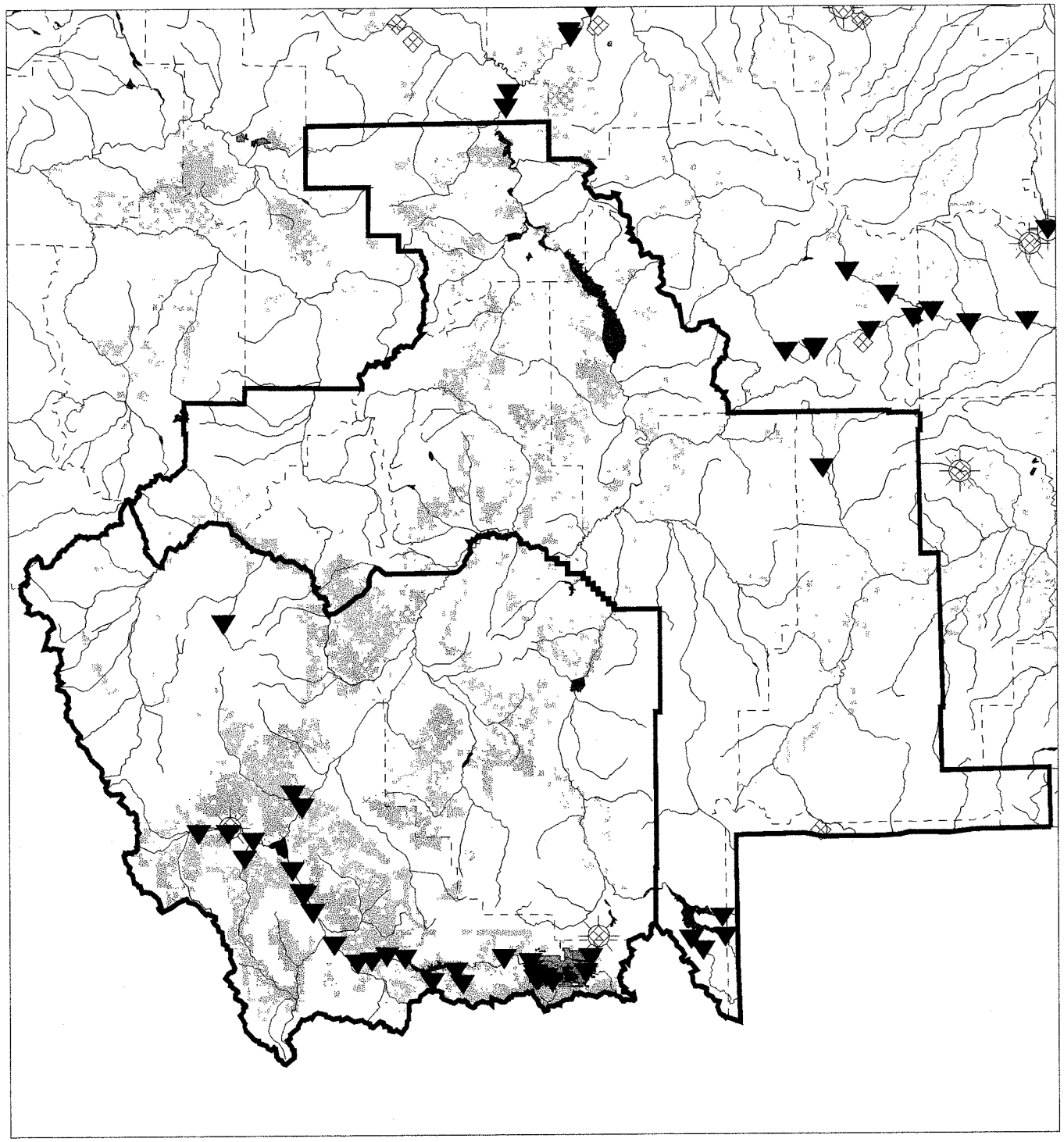
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Pseudacris triseriata

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

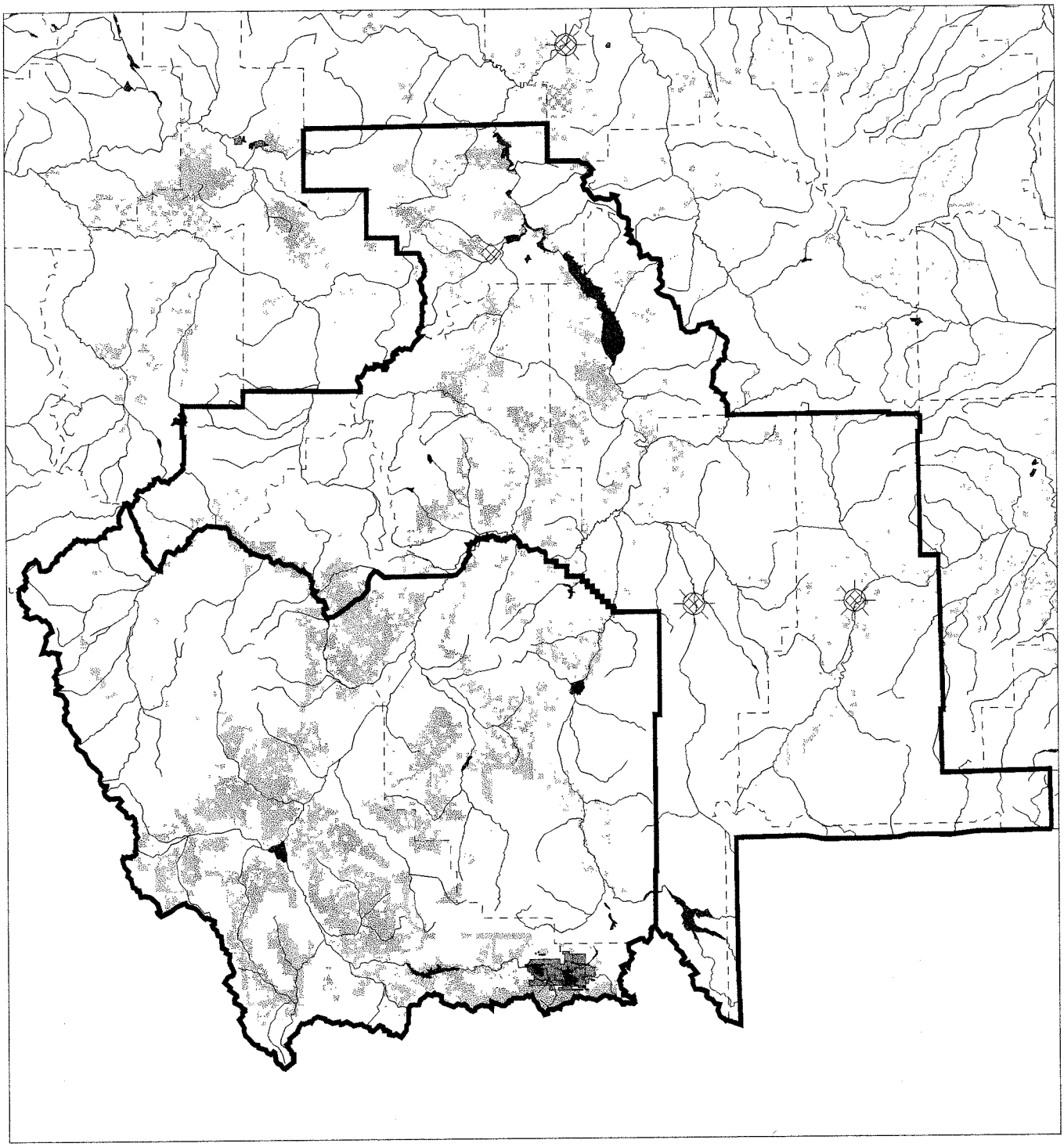
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Spea bombifrons

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

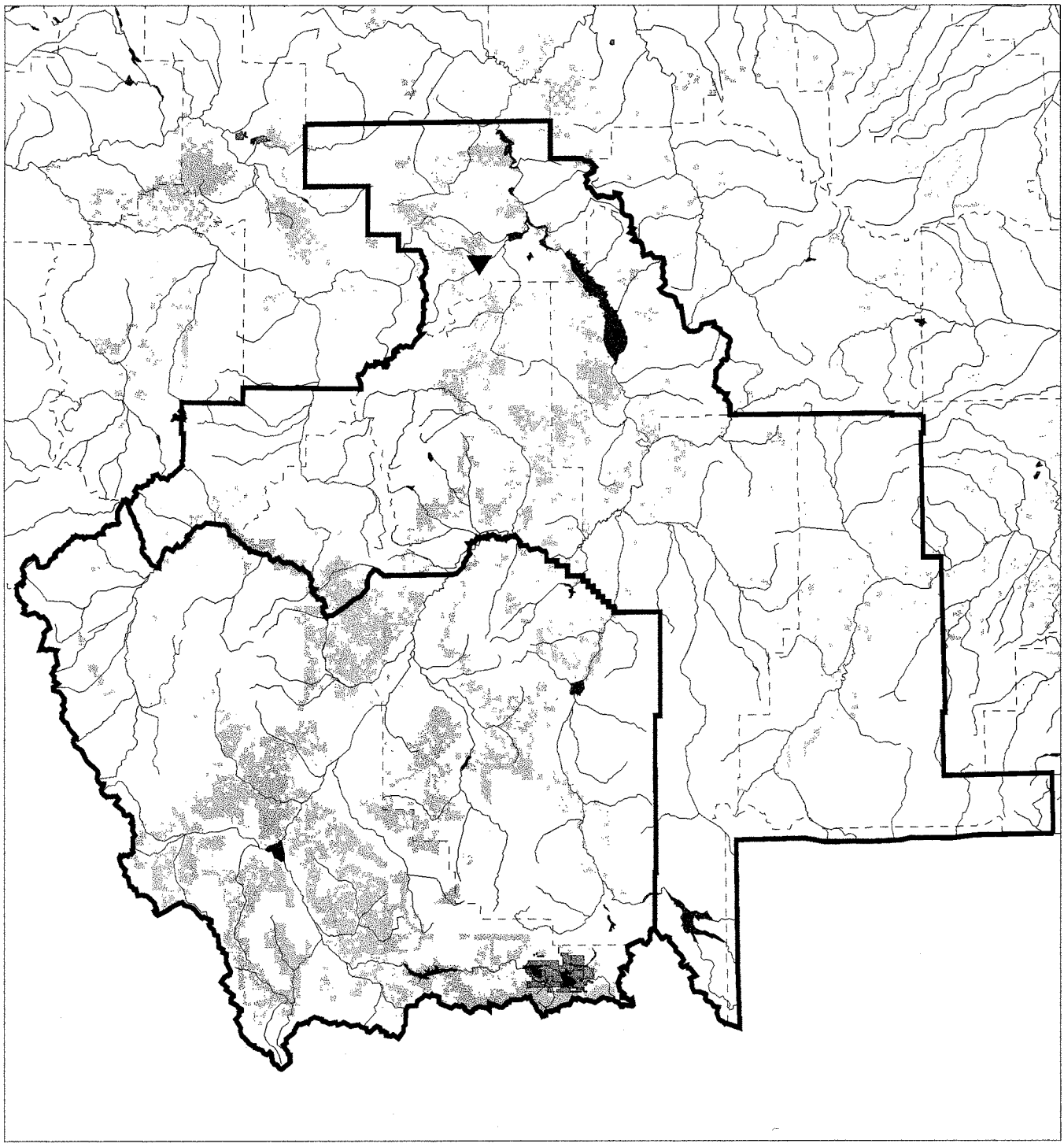
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Rana catesbeiana

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

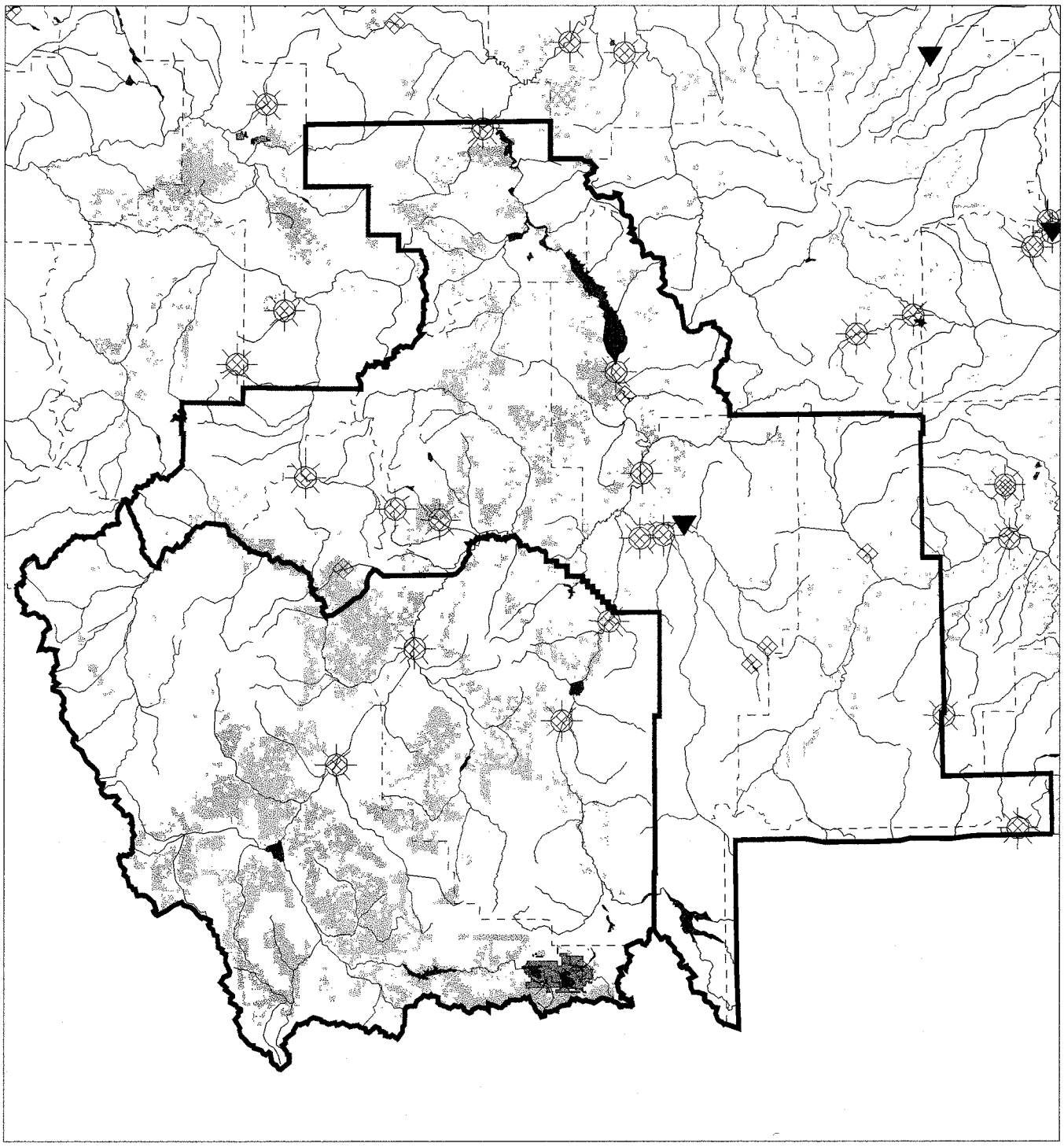
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Rana pipiens

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

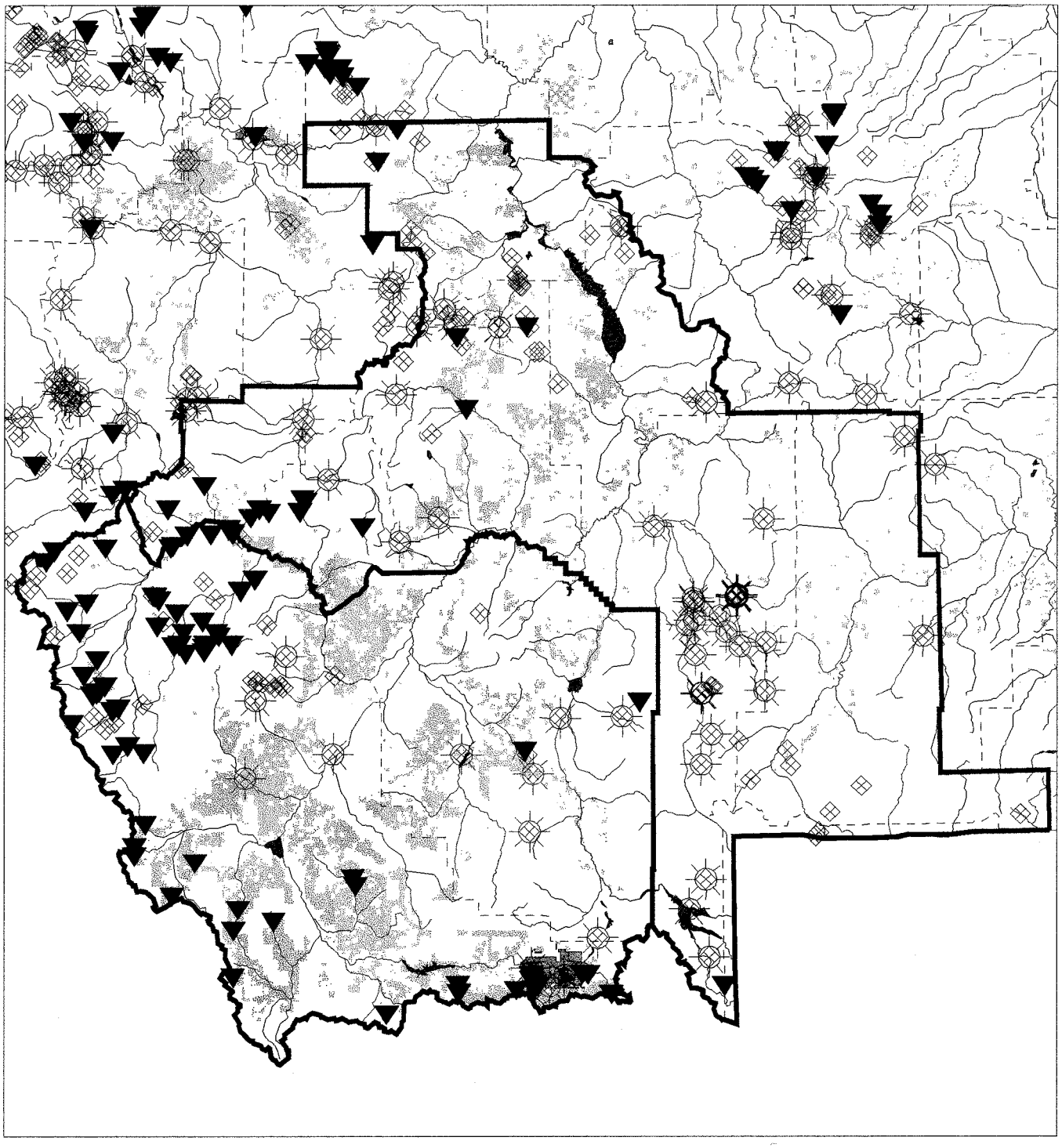
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Rana luteiventris

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



1996-1998 records

Pre-1996 records

Museum collections

0 10 20 30

Scale in Miles

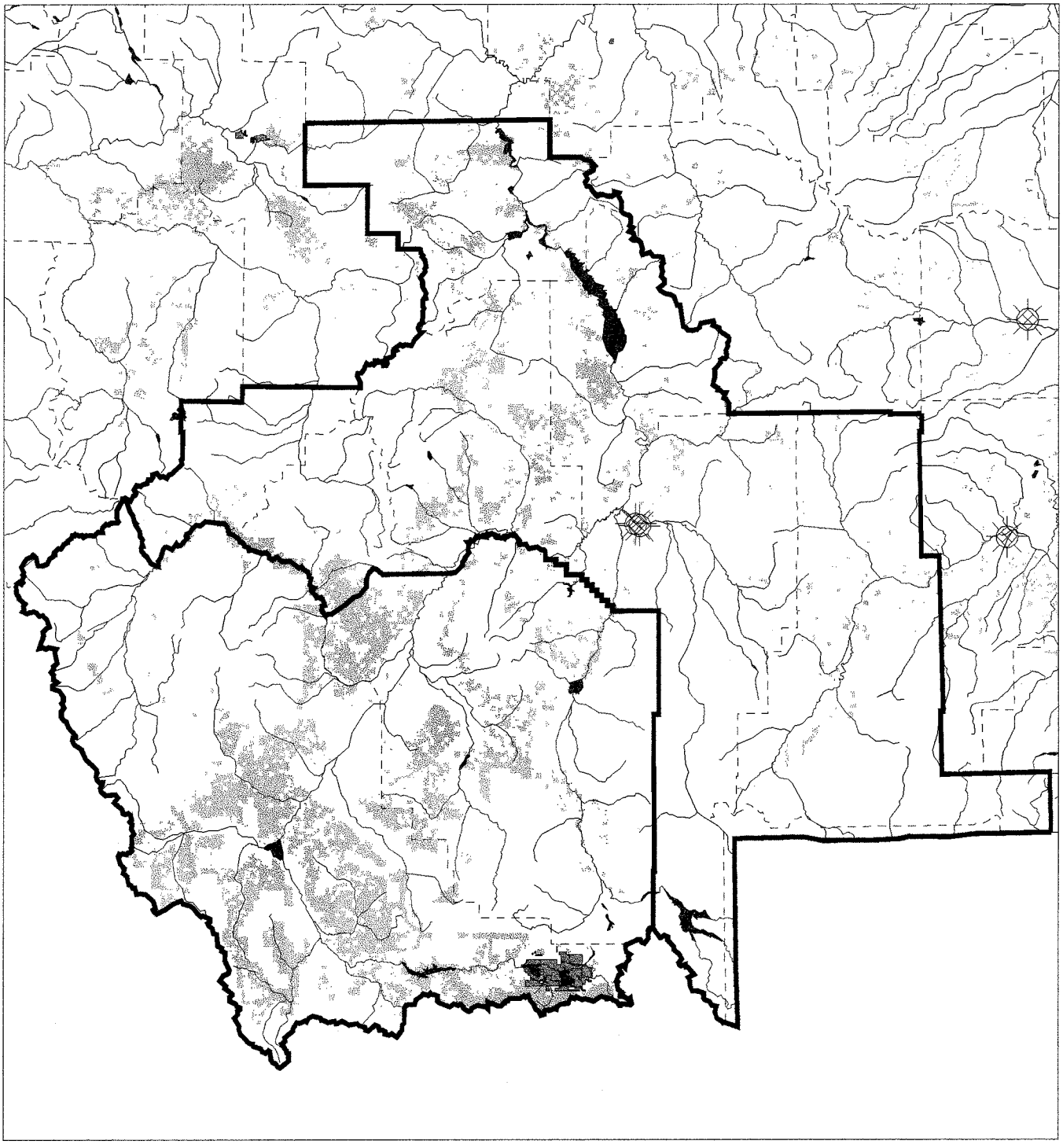
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Phrynosoma hernandesi

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

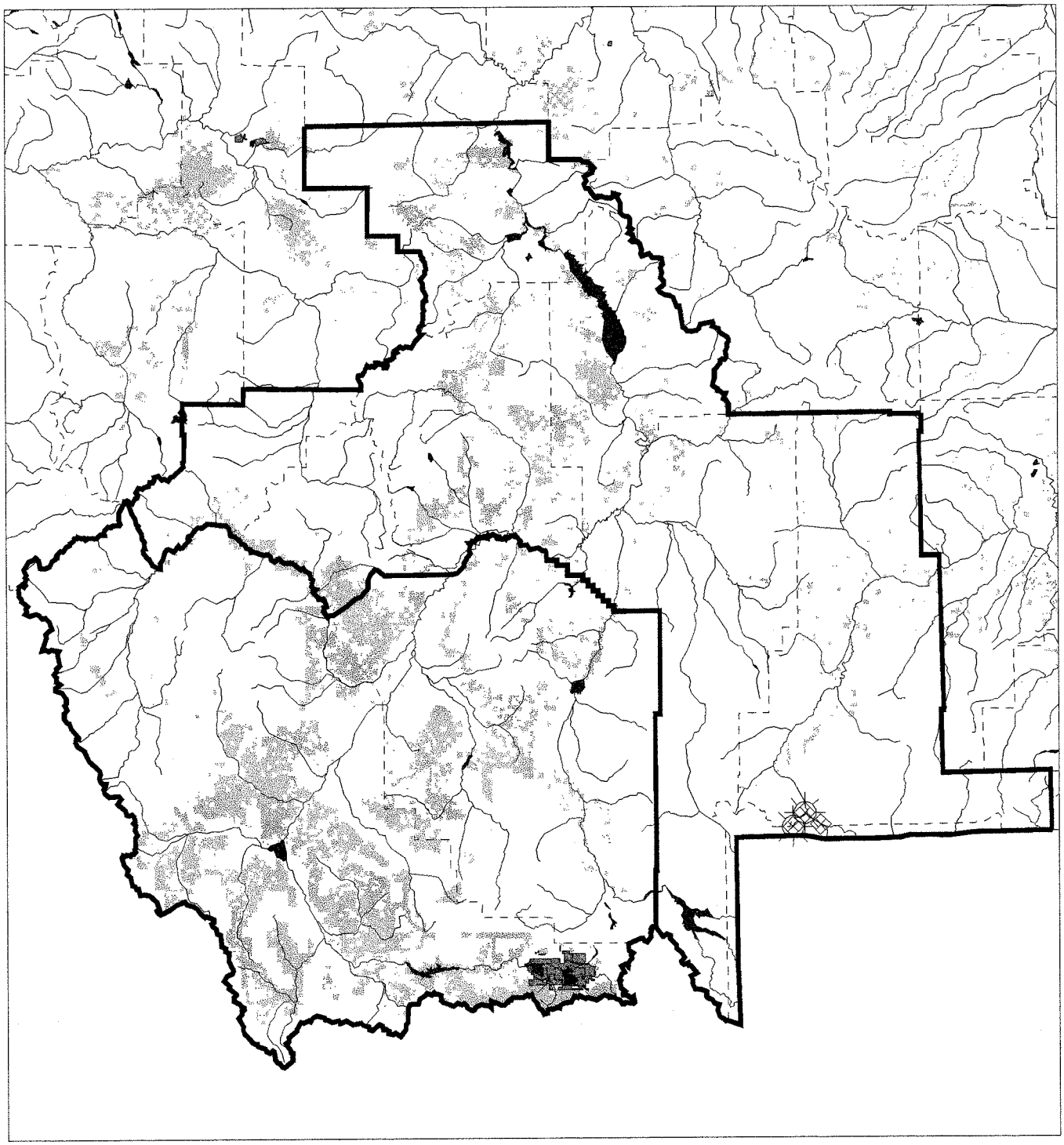
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Sceloporus graciosus

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

Museum collections

0 10 20 30

Scale in Miles

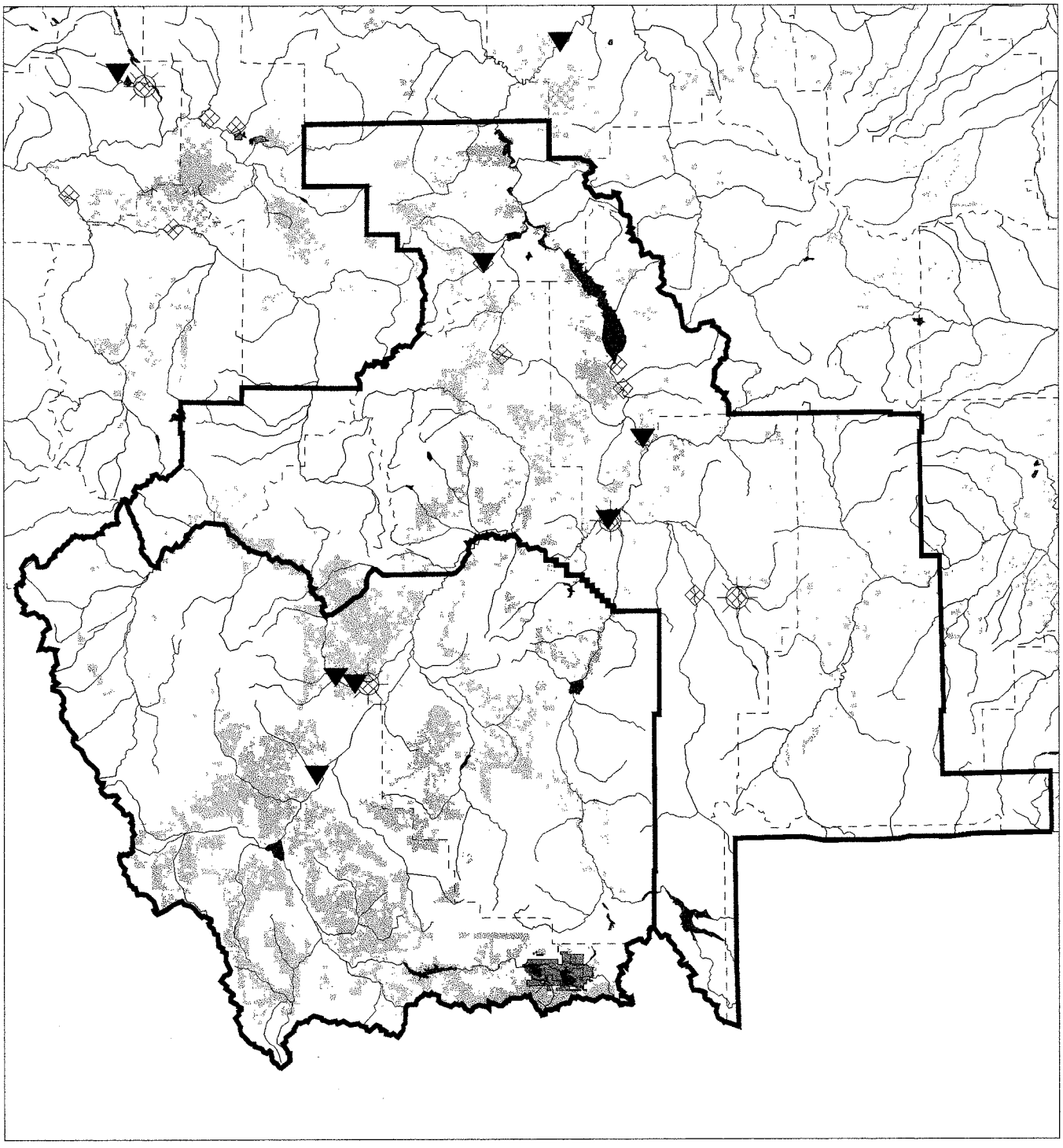
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Chrysemys picta

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

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Scale in Miles

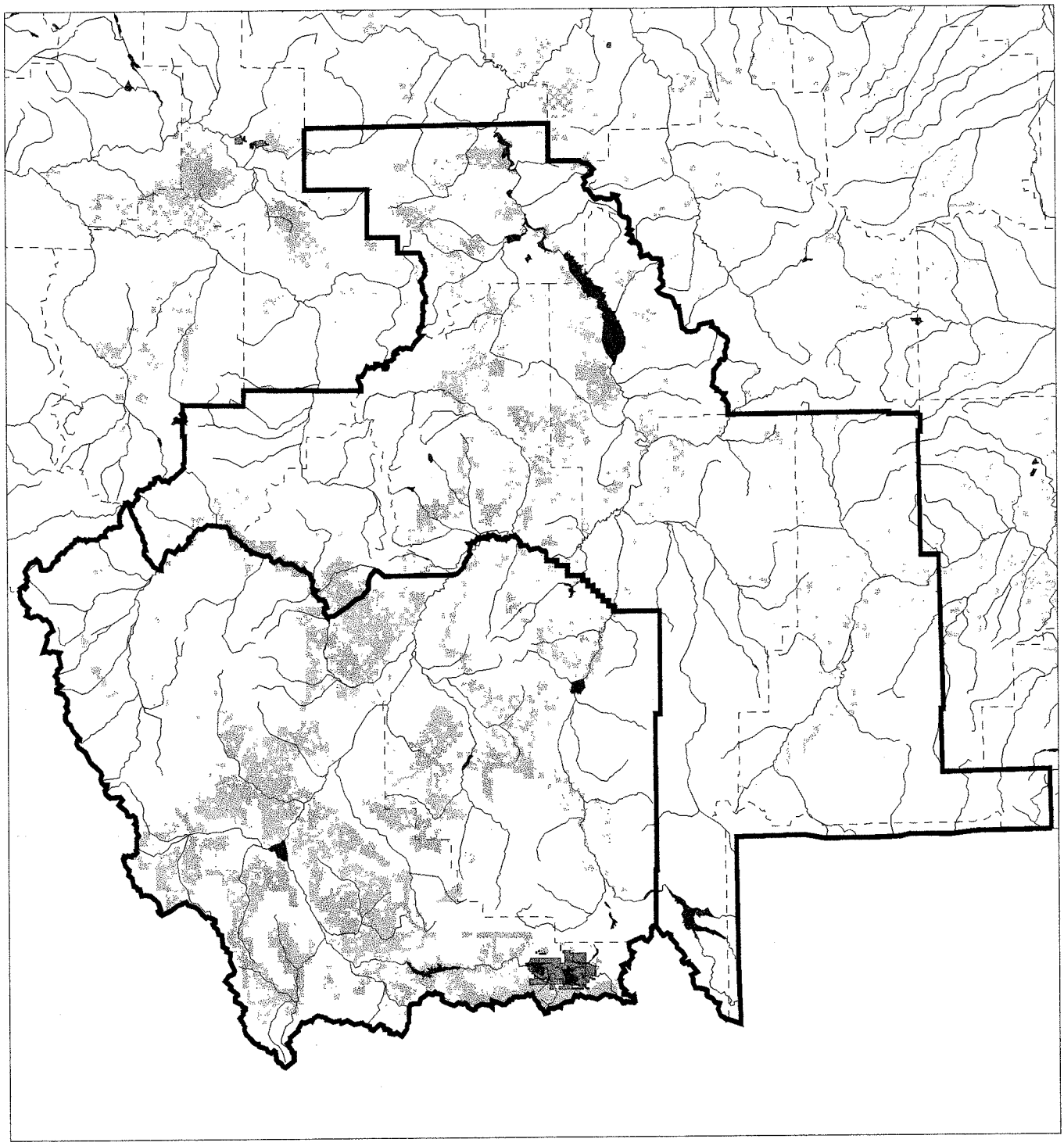
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Trionyx spiniferus

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

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Scale in Miles

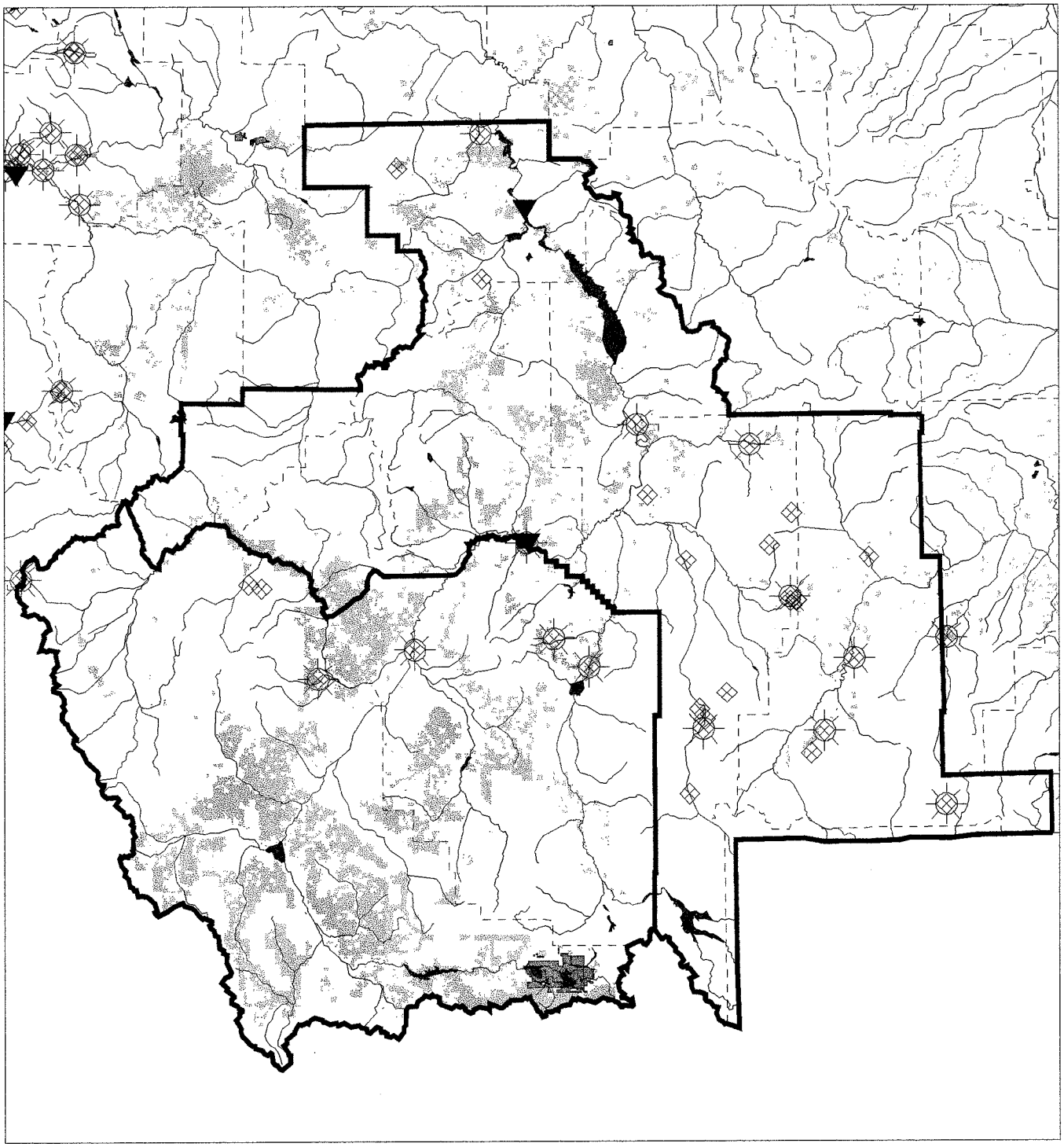
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Charina bottae

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

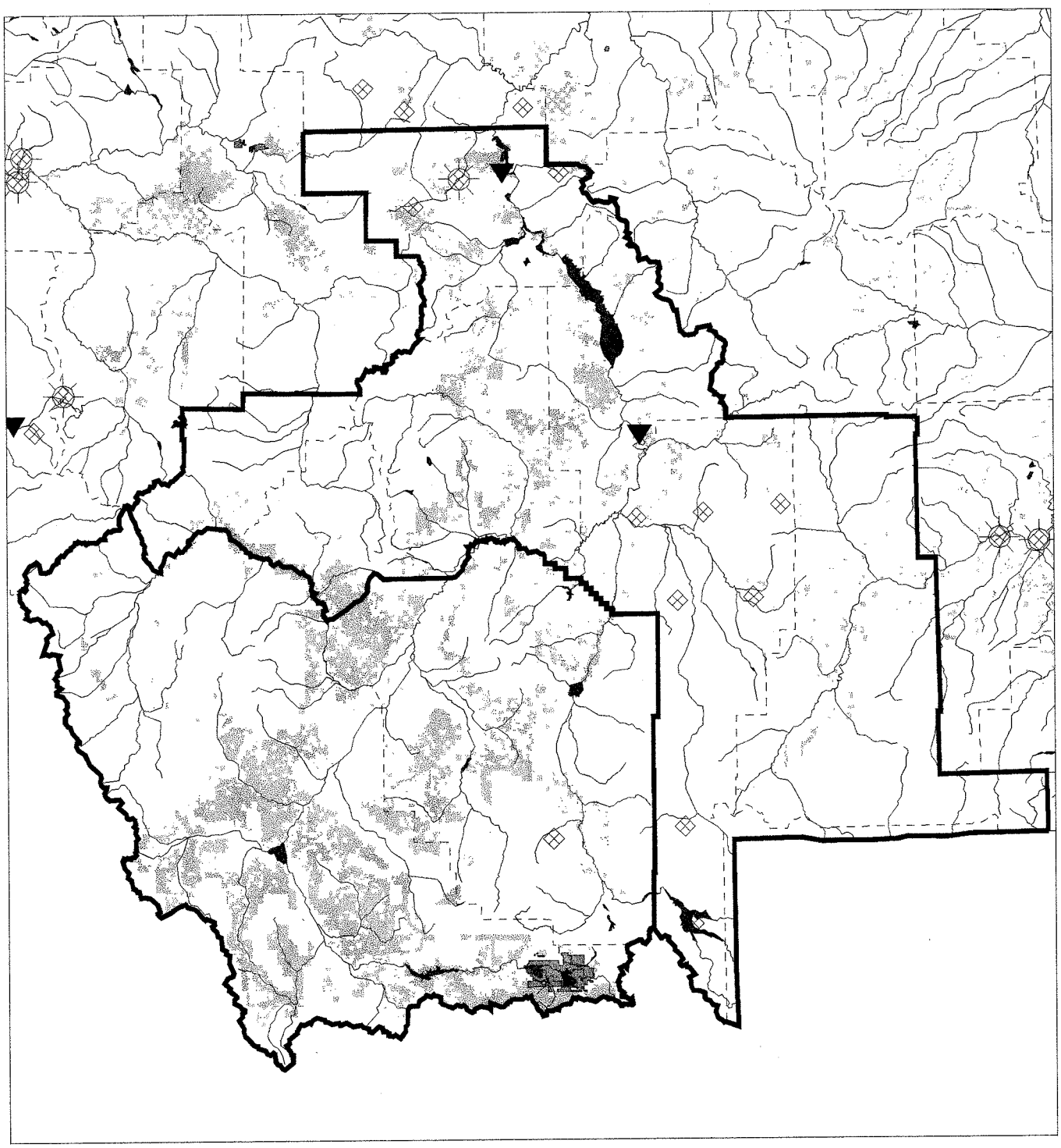
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Coluber constrictor

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

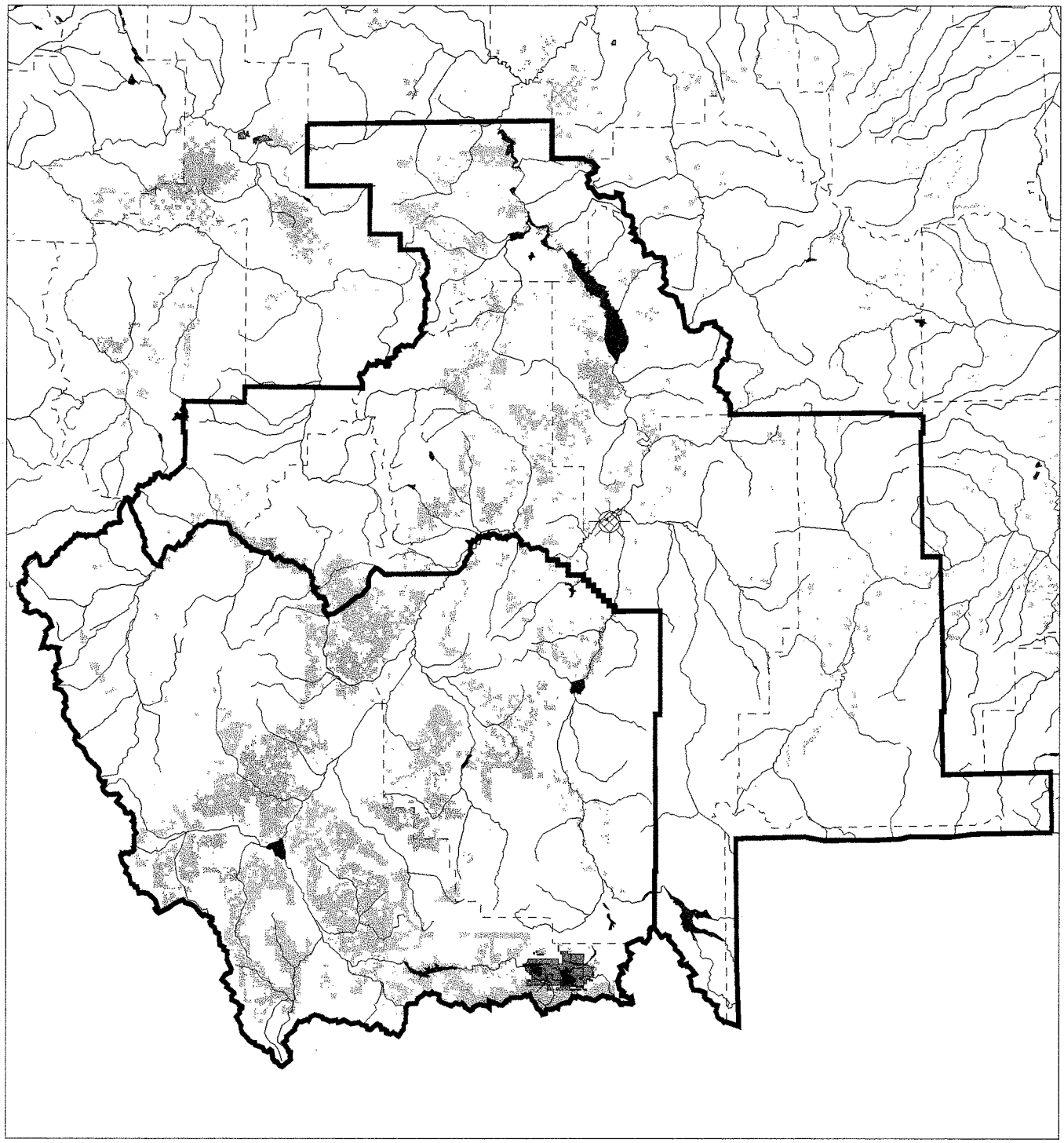
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Lampropeltis triangulum

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

Museum collections

0 10 20 30

Scale in Miles

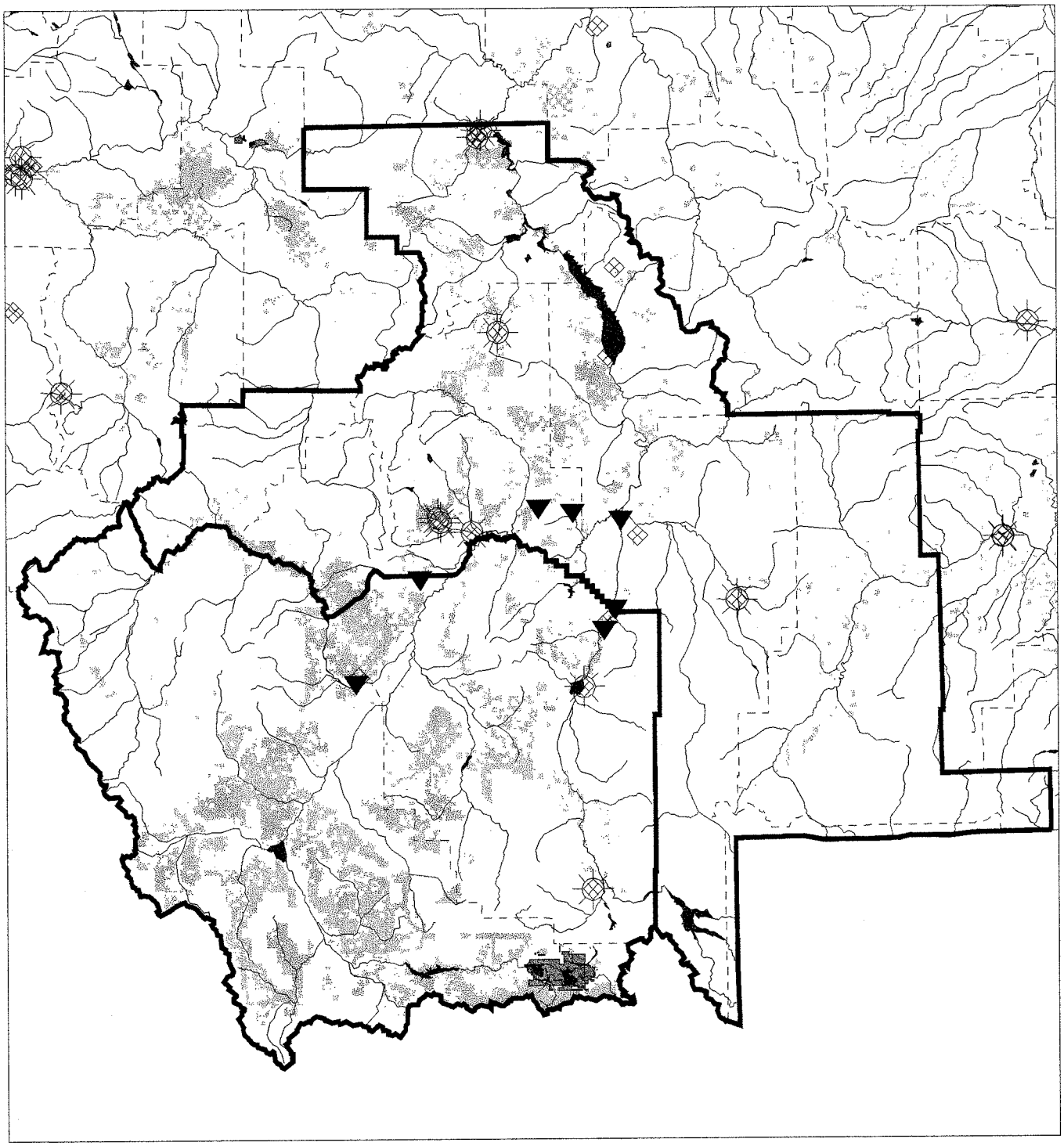
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Pituophis catenifer

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

✳ Museum collections

0 10 20 30

Scale in Miles

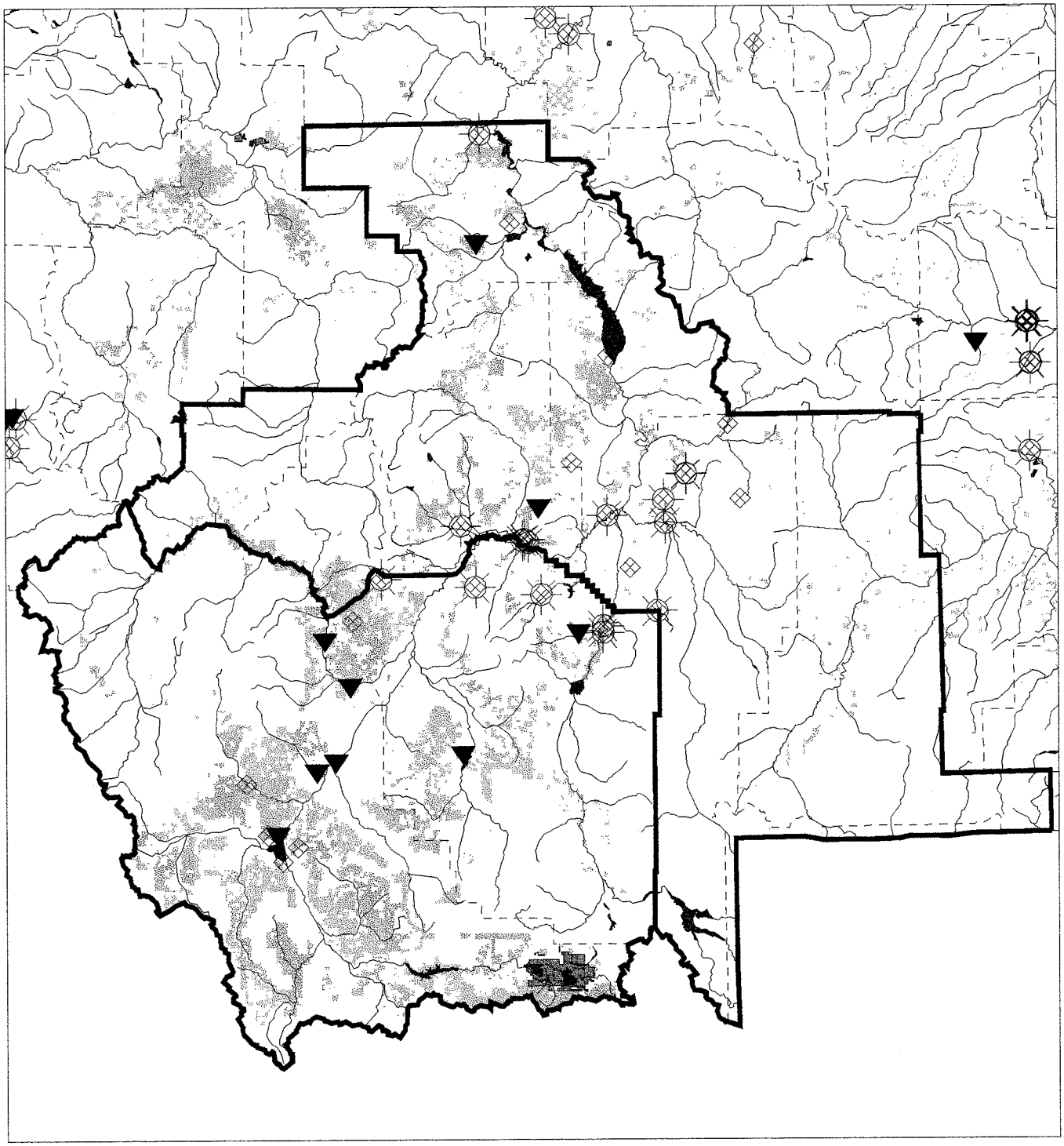
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Crotalus viridis

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

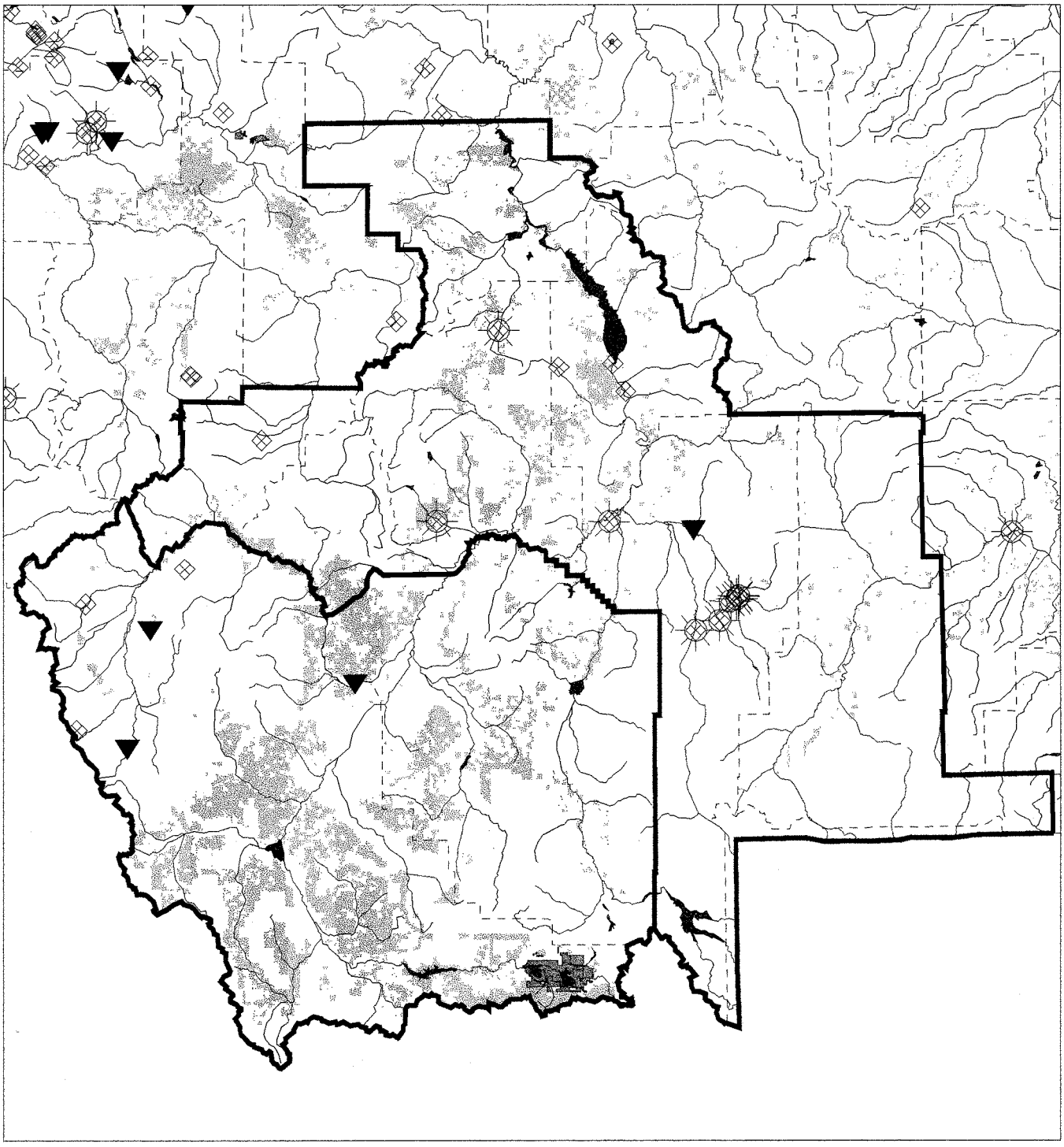
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Thamnophis sirtalis

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



▼ 1996-1998 records

◈ Pre-1996 records

☼ Museum collections

0 10 20 30

Scale in Miles

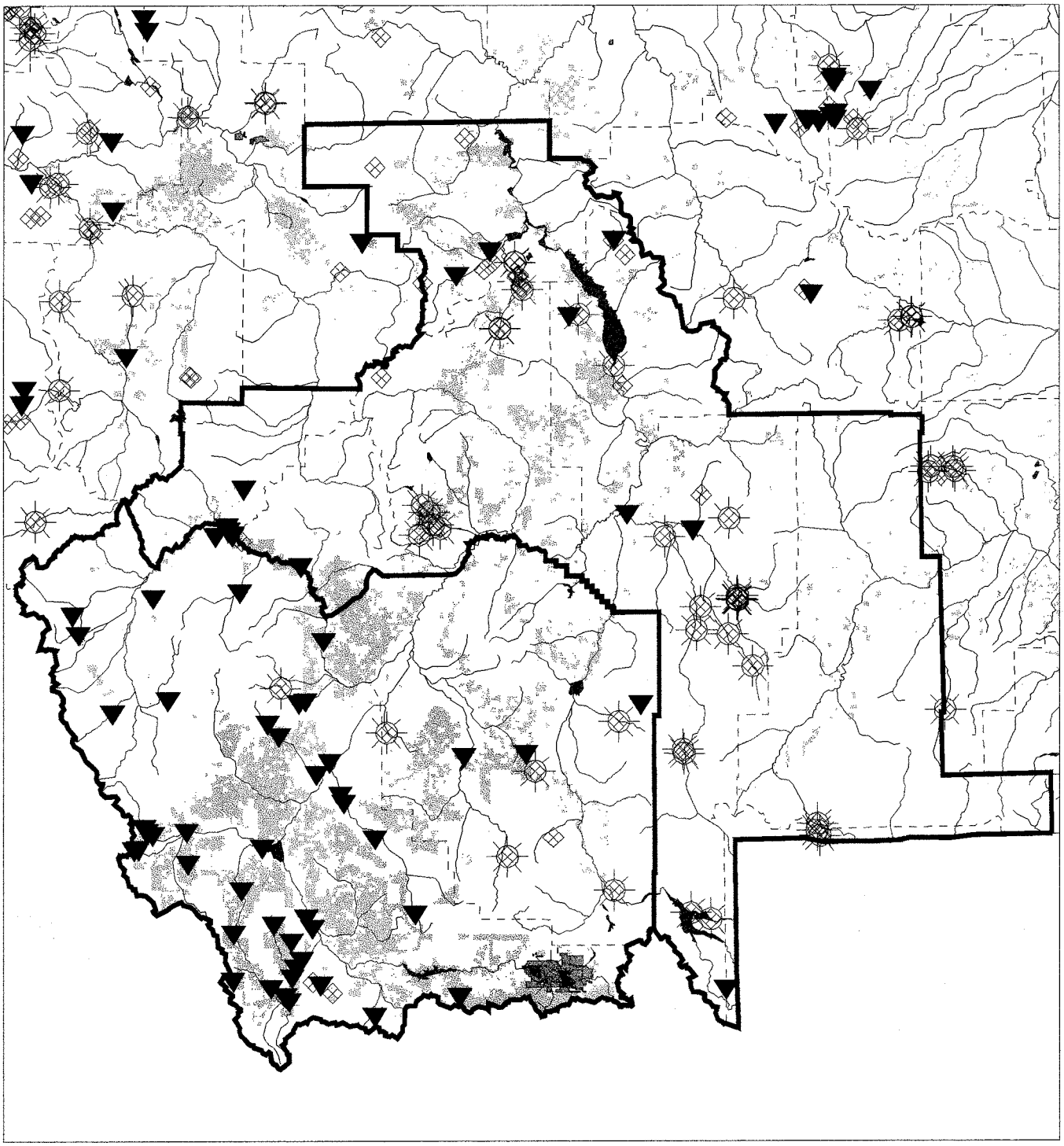
BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998

Observations of Thamnophis elegans

Dillon & Headwaters Resource Areas, and Red Rock Lakes NWR



1996-1998 records

Pre-1996 records

Museum collections

0 10 20 30

Scale in Miles

BLM Lands

USFWS Areas

Montana Natural Heritage Program, December 21, 1998